June 1955

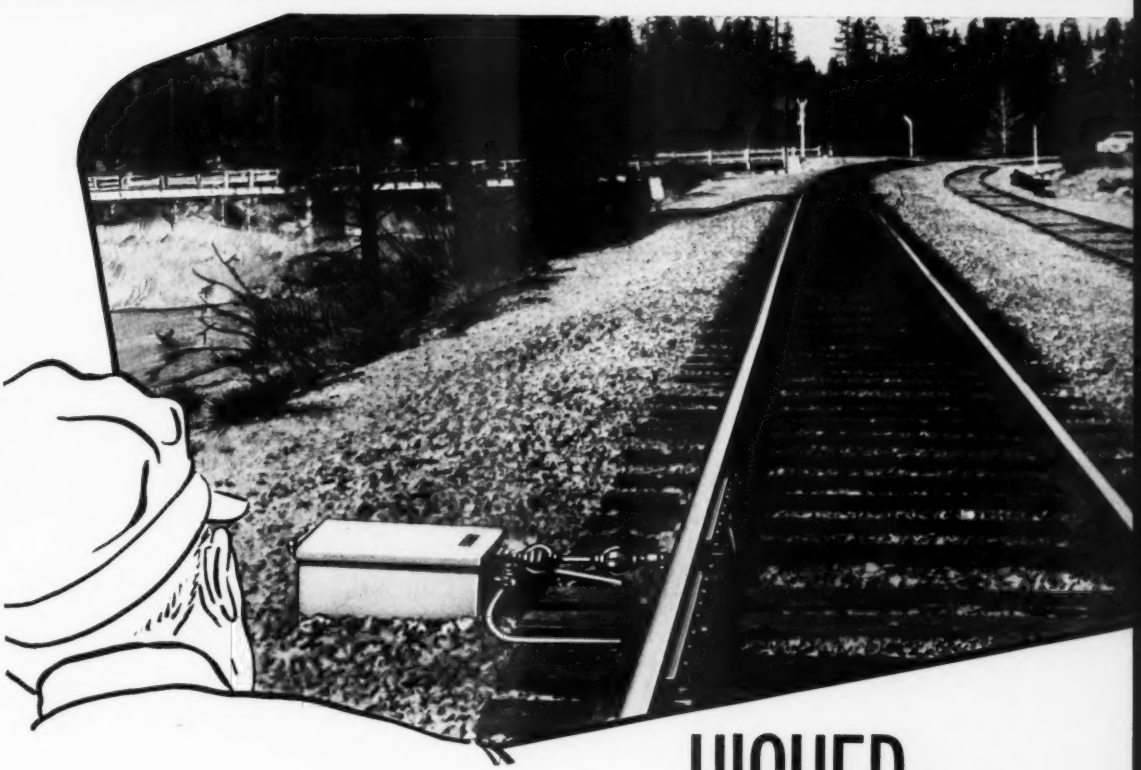
RAILWAY TRACK and STRUCTURES

One of Five Specialized Railway Age Publications

n This Issue:

- Taking Off the Rough Spots
- Flash Butt-Welding of Rail
- School Days Are Here Again
- New Automatic Gang Tamper
- Contents—page 27

FORMERLY Railway Engineering and Maintenance



TAKE CURVES AT TODAY'S HIGHER SPEEDS with GREATER SAFETY

install MECO rail and flange lubricators

MECO Rail and Flange Lubricators reduce friction and wear on rails and wheels, by applying grease between the wheel flanges and the rail head.

This not only increases safety, but also doubles to quadruples curve rail and locomotive wheel flange life.

Other MECO Products: Mack Switch Point Protectors (Prolong Switch Rail Life) • Meco Rail Layers (Lay Standard, Long, or Continuous Welded Rails) • Tylife (Bonds Spikes or Tie Plugs into Ties).

G-1026

★ Maintenance Equipment Company ★

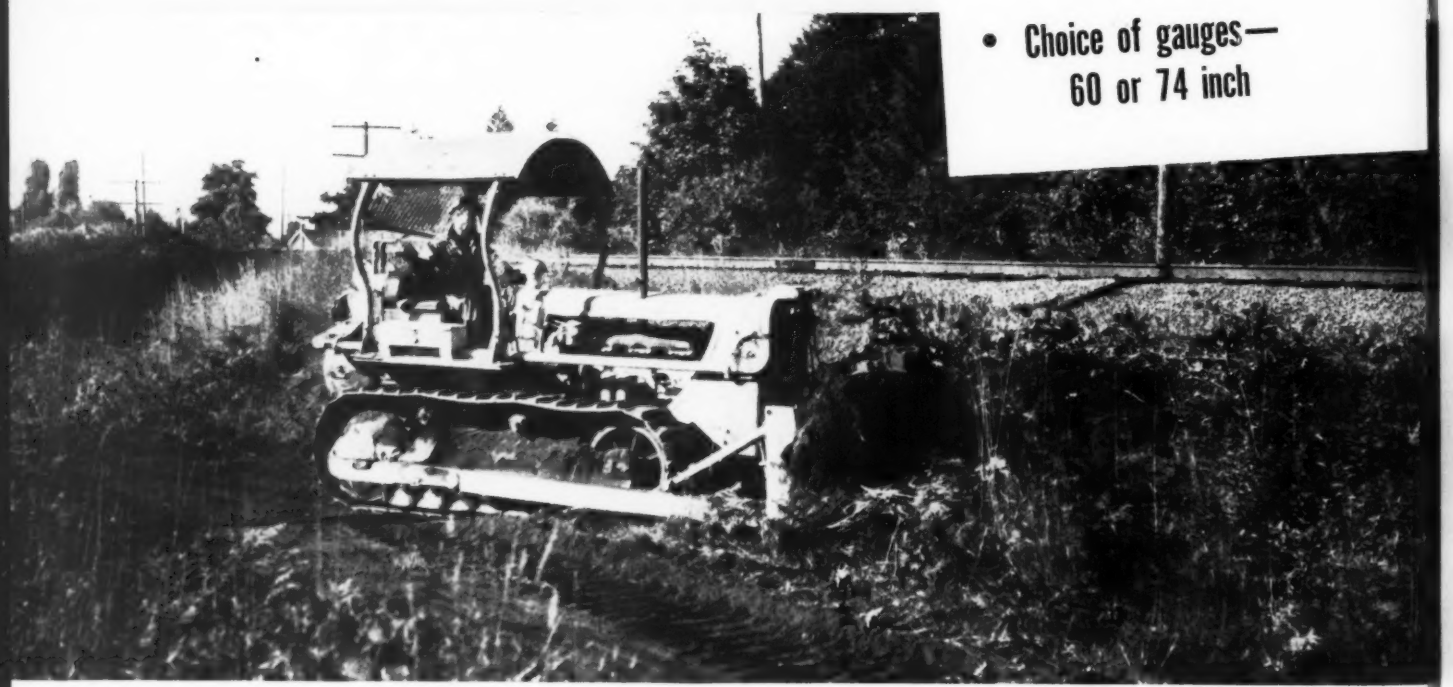
RAILWAY EXCHANGE BUILDING • CHICAGO 4, ILLINOIS

ON THE GREAT NORTHERN

The D6 makes off-track cleaning a quick, low-cost job

The CAT D6 Tractor gives you:

- 75 drawbar horsepower
- New oil-type flywheel clutch
- Finger-tip steering
- Five speeds forward—four reverse
- Choice of gauges—60 or 74 inch



The Caterpillar D6 Tractor is cleaning and shaping right-of-way at the rate of a half-mile per day for the Great Northern Railway near Marysville, Washington. It is one of four CAT* Diesel Tractors on the job in the division.

These hard-working machines, equipped with bulldozers, keep railroad production high and costs low for a number of exclusive Caterpillar reasons. The great new oil-type flywheel clutch is an example. Not only does it add dependability but it reduces service and maintenance costs. Clutch adjustments are rarely needed. Disc replacements are required no more often than engine overhauls.

And the bulldozer is an important part of the economy story. The moldboard is engineered to roll earth forward and hold large loads on the blade. It can be both tilted and tipped by *one man*. Box-section reinforcements run the entire length of the blade for rigidity. All these features contribute to the machine's ability to deliver big production at low cost.

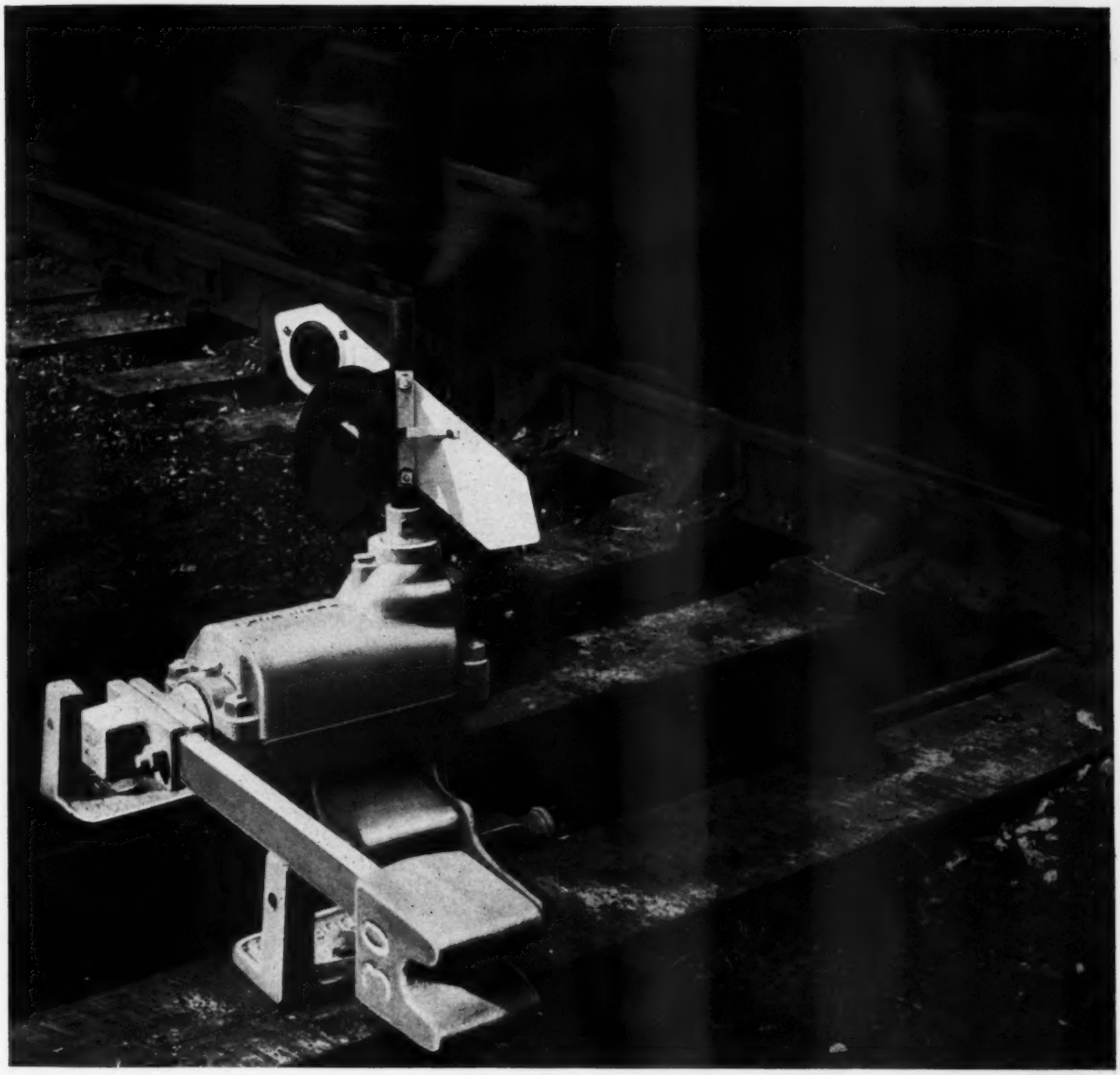
Your Caterpillar Dealer will carry *your* inventory of Cat parts—parts you can trust. And you can be sure he will understand *your* off-track maintenance problems. Why not call him today and ask for a demonstration of the dependable equipment that will do your job quicker and more economically?

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE



A run-through is a snap with Model 99

You watch as a cut of cars moves into a closed switch. The wheels nudge the points, and *snap!* the switch clicks over to the new position. When the engine passes smoothly through, you notice that the points continue to hold the new setting, the target has turned to show the proper indication, while the throwing lever remains unmoved.

The switchman explains that any number of run-through movements can be carried out without budging the lever. Then, as if reading your mind, he picks up the lever and throws the switch by hand. "Works either way," he says. "We've got a number of Model 99's, and all work slick as a whistle."

That's Bethlehem's Model 99 at work. That is the reliable, do-it-every-time performance of railroading's finest and huskiest automatic stand. Soundly designed and superbly muscled, Model 99 has the heart for many, many years of this tough yard and siding service.

Railroads seem to think highly of Model 99, if the number of purchases in less than two years means anything. But perhaps a more helpful criterion for you would be a first-hand look. One of our engineers can, and gladly will, arrange a demonstration at your convenience. Just call or drop a line to our nearest office.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

Published monthly by Simmons-Boardman Publishing Corporation, Emmett Street, Bristol, Connecticut, with editorial and executive offices at 79 West Monroe Street, Chicago 3, Illinois: 30 Church Street, New York 7, New York. Subscription prices: to railroad employees only in the United States and Possessions, and Canada, one year $2.00; $3.00 for two years. Single copy 50 cents. Entered as second class matter at the Post Office at Bristol, Conn., November 26, 1954, under act of March 3, 1879. Volume 51, No. 6.

DOW

... smooth ride for oil on the move!

DOW PRODUCTS

keep roadbeds clear of grass and weeds... control brush on right-of-ways

Oil and a thousand-and-one other products are rolling now on railway lines kept in first-class shape with chemicals. Specific Dow chemicals built to do specific jobs now offer railway men a better way to maintain vegetation-free right-of-ways at lower cost per train-mile.

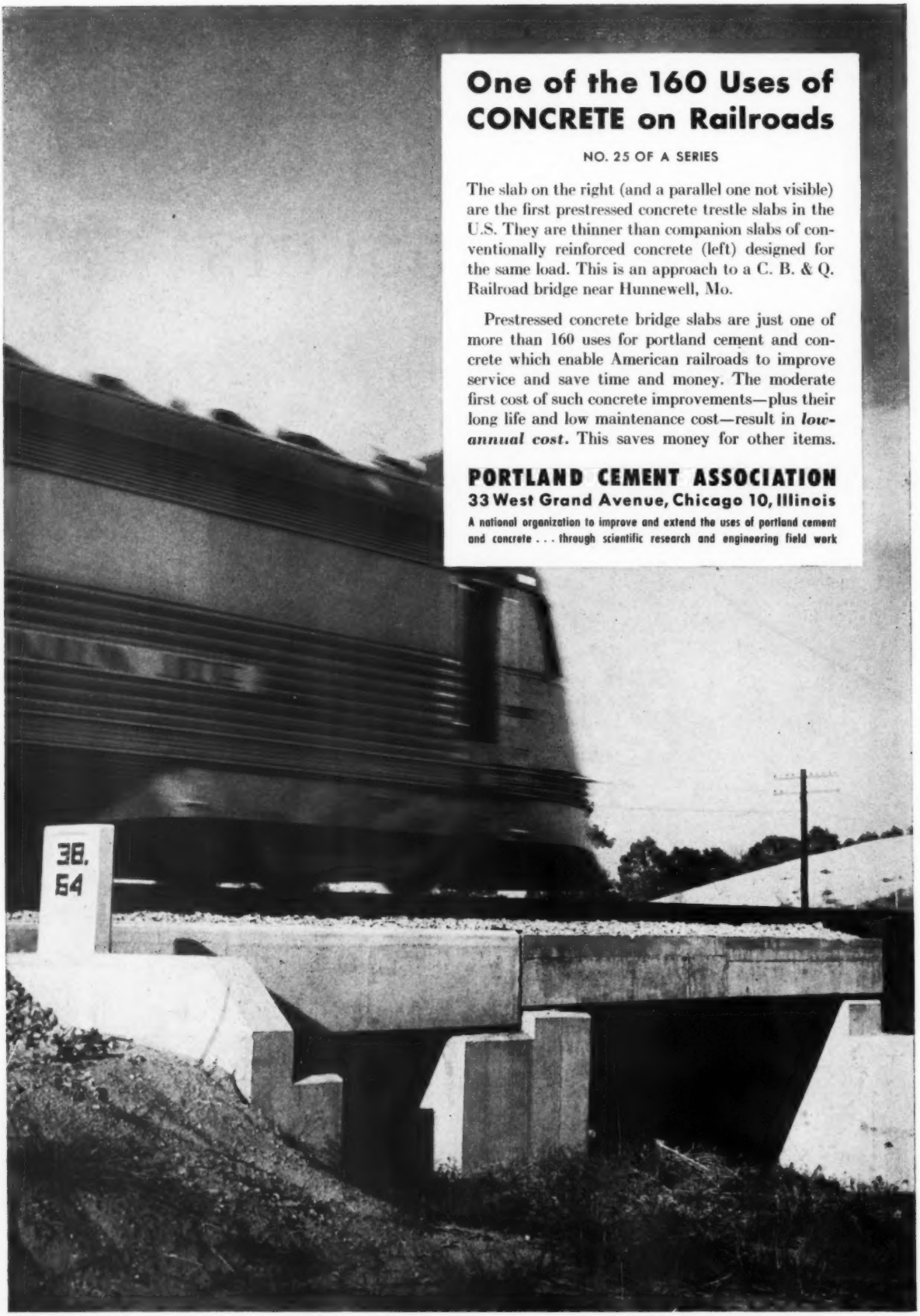
New Dow Dalapon Sodium Salt Solution* teams up with the famous 2-4 Dow Weed Killer, Formula 40—to maintain mile after mile of clean ballast and berm. The two—a systematic grass killer and a highly effective 2,4-D weed killer—should be combined to control grasses and broad-leaved weeds in roadbeds in a single application.

Brush and weeds along the right-of-way call for spraying with Esteron® Brush Killer. Its low-volatile 2,4-D and 2,4,5-T esters give good control of tough woody vegetation—keep the right-of-way neat-looking and economical to maintain. Your inquiries are invited. Dow sales and technical men are available for consultation and assistance on your vegetation control program. THE DOW CHEMICAL COMPANY, Agricultural Chemical Sales Department, Midland, Michigan. In Canada: Dow Chemical of Canada, Limited, Toronto, Canada.

**Available in tank car quantities only.*

you can depend on DOW AGRICULTURAL CHEMICALS

DOW



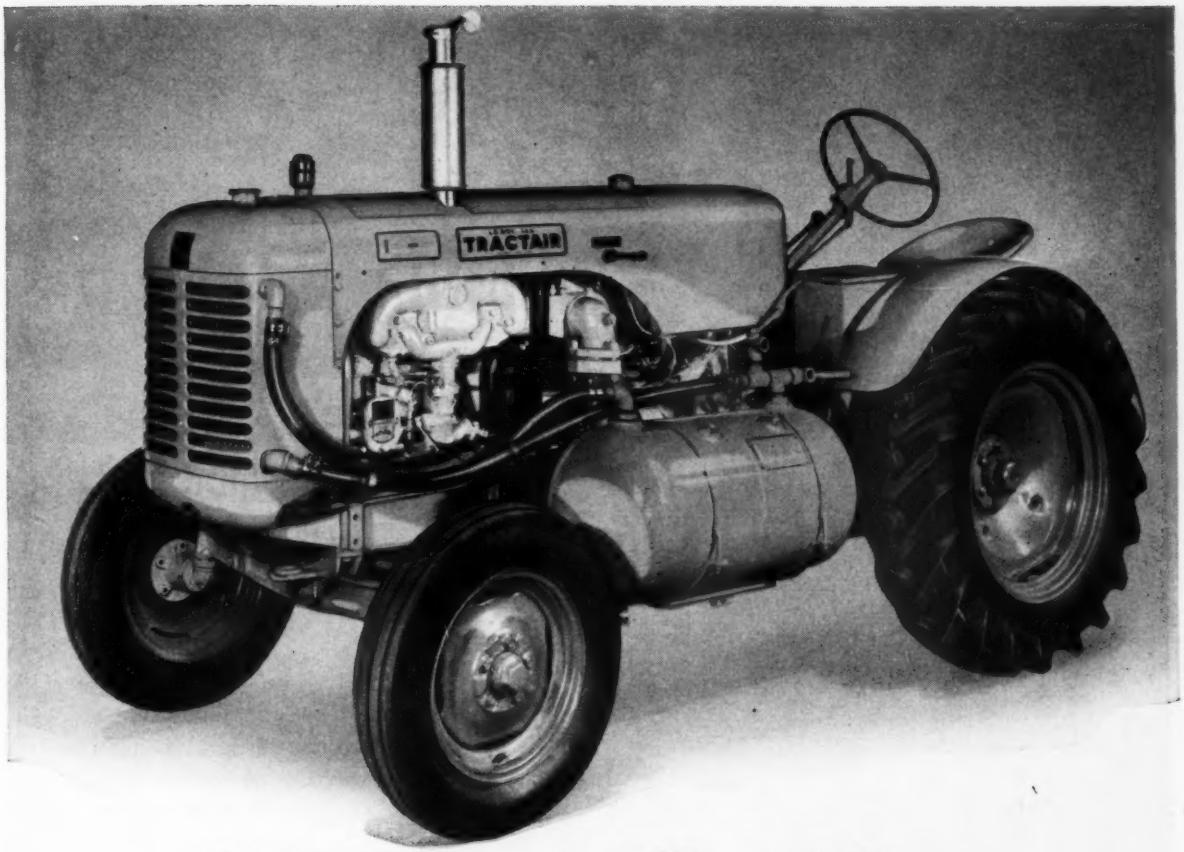
One of the 160 Uses of CONCRETE on Railroads

NO. 25 OF A SERIES

The slab on the right (and a parallel one not visible) are the first prestressed concrete trestle slabs in the U.S. They are thinner than companion slabs of conventionally reinforced concrete (left) designed for the same load. This is an approach to a C. B. & Q. Railroad bridge near Hunnewell, Mo.

Prestressed concrete bridge slabs are just one of more than 160 uses for portland cement and concrete which enable American railroads to improve service and save time and money. The moderate first cost of such concrete improvements—plus their long life and low maintenance cost—result in ***low-annual cost.*** This saves money for other items.

PORTLAND CEMENT ASSOCIATION
33 West Grand Avenue, Chicago 10, Illinois
A national organization to improve and extend the uses of portland cement and concrete . . . through scientific research and engineering field work



Still More for Your Money

...Le Roi Tractair compressed-air output is increased from 105 cfm to 125 cfm

For the past ten years, the Tractair unit has been making friends and cutting costs on jobs everywhere. Now, with its increased capacity, it is even more productive.

Tractair is still a combination 42-hp wheel tractor and compressor. But now it produces 125 cfm, instead of 105 cfm of air. It will run five fast-hitting, easy-handling Cleveland C10T tie tampers instead of four, an extra breaker, backfill tamper, spader, etc. It works on a two-to-one slope with safety and has the mobility to take this extra air power almost anywhere you need it.

Other new features of the 125 Tractair unit are: Econotrol — which varies engine speed to match air demand and promotes longer engine life. An aftercooler — which reduces the temperature and moisture content of the air so that air hose lasts longer — tools run better.

The 125 Tractair unit can be fitted with attachments, too, so that it can be used for loading, backfilling, digging, sweeping, hoisting, tamping and drilling.

There has been no change in the list price. This, plus Tractair's multi-purpose usefulness, means that you get still more for your money.

The Tractair unit with its mobility and versatility can cut your costs. A new bulletin is available — just write, either to us or to our Railroad Sales Dept., 327 South La Salle St., Chicago 4, Ill., for your copy.

T-58A

LE ROI *Division of Westinghouse Air Brake Co.*

Milwaukee 14, Wisconsin

PORTABLE AIR COMPRESSORS · TRACTAIR · STATIONARY AIR COMPRESSORS · AIR TOOLS · ENGINES

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MONOTUBE STEEL PILES

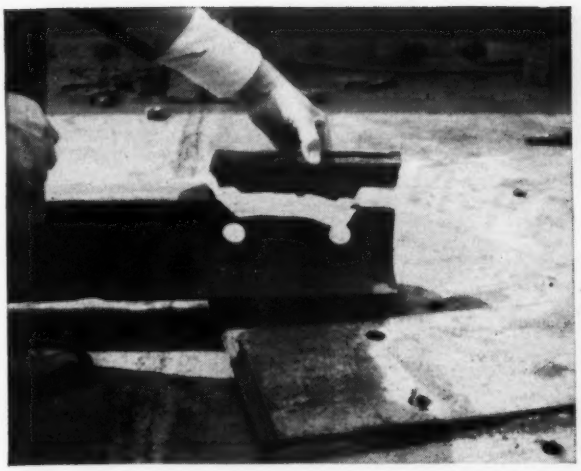
. . . easily extended right on the job

All it takes is a fast, simple weld to extend Monotube steel piles to any required length. Either standard sections, or for added economy, cut-offs from previously driven piles can be used. And while one pile is being extended, driving continues on an adjacent pile. There's *no* lost time!

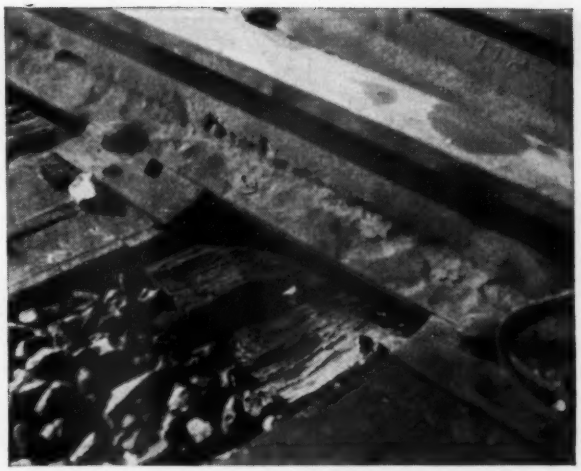
Here's another important point to remember . . . Monotubes combine light weight and ease of handling with cold-rolled strength for *faster* driving . . . and at lower cost! On most jobs, driving can be handled quickly, easily by light, mobile rigs. Find out for yourself how Monotube piles save time and money on *all* types of foundation work. Write today to The Union Metal Manufacturing Company, Canton 5, Ohio, for your copy of Catalog No. 81.

Monotube Foundation Piles

UNION METAL



Corrosion fatigue caused this rail end failure. NO-OX-ID prevents these hazards.



Rail base eaten away by brine drippings. NO-OX-ID protective coatings prevent this deterioration.

Steel bridges damaged by rust cost money. NO-OX-ID's long-life protection prevents costly corrosion.

Rusty gauge rods are difficult to adjust. NO-OX-ID stops corrosion...makes adjustment easy for years to come.

NO-OX-ID PROTECTS...NO-OX-ID SAVES

Corrosion takes its toll wherever steel is used. Replacing rust-ruined trackage, signal equipment, bridge and overpass steel members is expensive and unnecessary.

Many leading railroads rely on Dearborn NO-OX-ID to cut down materials and maintenance costs wherever steel is exposed. Consult your Dearborn Field Engineer. His broad railroad experience, plus Dearborn's extensive research and laboratory facilities, can save you important money. It pays to investigate.

Dearborn NO-OX-ID®

AN APPLICATION FOR EVERY RAILROAD NEED

NO-OX-ID is different! It protects both mechanically and chemically.

Write for Dearborn NO-OX-ID Bulletins 3007-3009-A for complete information.

Dearborn Chemical Company
Dept. RTS, Merchandise Mart Plaza,
Chicago 54, Ill.

Gentlemen:

☐ Please send me NO-OX-ID Bulletins 3007 and 3009-A.
☐ Have a Dearborn Field Engineer call.

Name.....*Title*.....

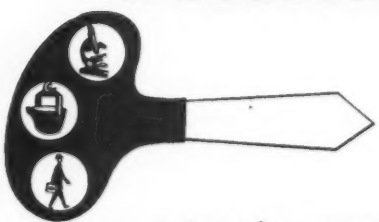
Railroad.....

Address.....

City.....*Zone*.....*State*.....

Alcoa supplies extrusions with four integral ribs to insure maximum rigidity in crossbuck blades. Modern application techniques make short work of bonding reflective sheeting to the metal.

GREAT NORTHERN INCREASES LIFE OF SIGNS, CROSSBUCKS WITH ALCOA® ALUMINUM

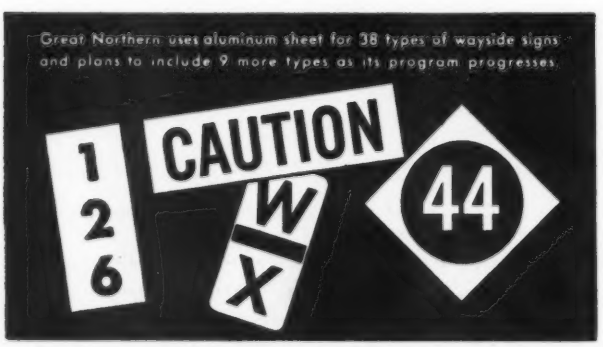


As fast as they wear out, all existing crossbucks and 90 per cent of wayside signs on the Great Northern Railway are being replaced with reflectorized aluminum. Now in its tenth year, this system-wide program reduces maintenance costs at the same time it increases safety.

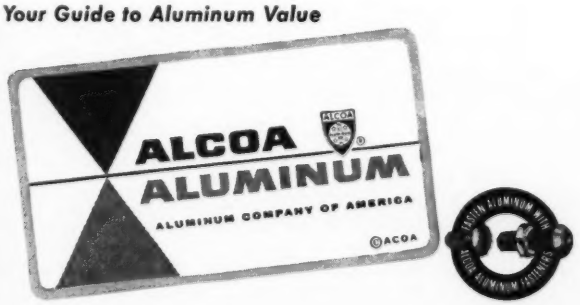
Tough Alcoa alloys defy corrosion and they withstand winds in excess of 100 mph. The resultant resistance to vandalism and rigorous weather lengthens sign life. Yet no field maintenance is required, nor are the sign backs ever painted.

Savings also extend to sign production where aluminum's light weight makes handling faster and easier.

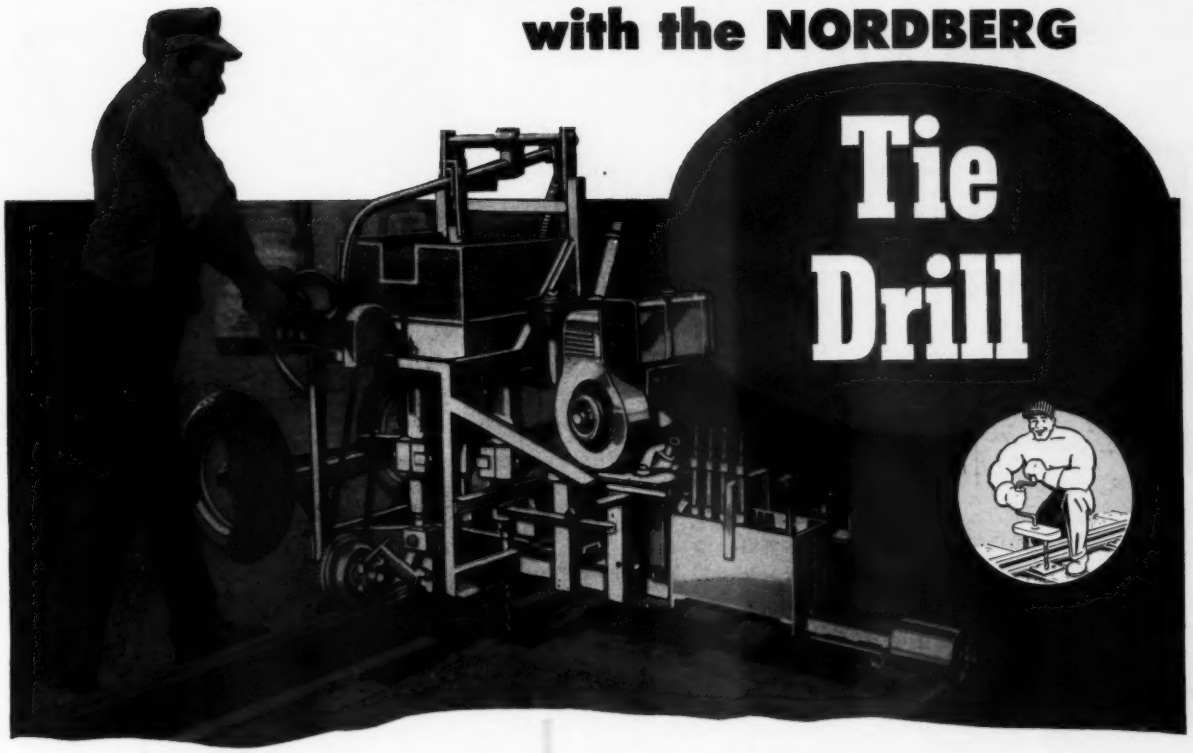
Alcoa is ready to help you get longer sign life and safety with extruded sections for crossbucks and with sheet and fasteners for wayside signs. Get the facts from your nearby Alcoa sales office. Or write: ALUMINUM COMPANY OF AMERICA, 1977-F Alcoa Building, Mellon Square, Pittsburgh 19, Pennsylvania.


Great Northern uses aluminum sheet for 38 types of wayside signs and plans to include 9 more types as its program progresses.
126
CAUTION
W
X
44

Your Guide to Aluminum Value



save time and money
DRILL TIES BEFORE SPIKING
with the NORDBERG



Advantages:

- *Field drilling costs can be cut about 75%*
- *Speeds rail laying . . . drills two holes at once, in less than 3 seconds per hole*
- *Easily operated by one man*
- *Drills holes for rail holding or plate fastening spikes*
- *Always drills holes at right angles to tie*
- *Spikes have greater holding power . . . tie life is considerably extended*

THE fully proved Nordberg Tie Drill is the maintenance machine you need for cutting tie drilling costs . . . and for increasing the life of your ties.

This accurate machine is the fastest tie drill on the market. It is operated by one man, who can spot and drill 48 holes in 24 ties of one rail length in just 2½ minutes . . . which is less than 3 seconds per drilled hole.

You can't afford to overlook savings like this! For further details about the Nordberg Tie Drill, write for Bulletin 199.

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R755

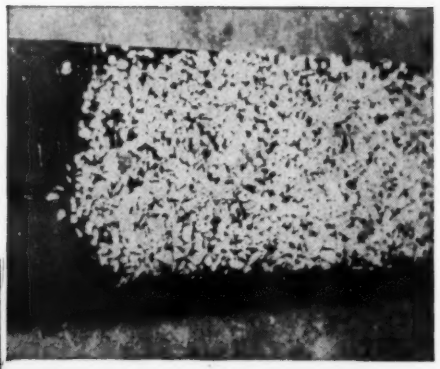
NORDBERG
"Mechanical Muscles"®

ADZING MACHINE • BALLAST ROUTER • CRIBEX® • BALLASTEX® • SCREENEX® • HYDRAULIC and MECHANICAL SPIKE PULLERS • SPIKE HAMMER • TIE DRILL • POWER JACK • POWER WRENCH • RAIL DRILL • RAIL GRINDERS • TRACK SHIFTER • DSL® YARD CLEANER • TRAKLINER • GANG TAMPER • DUN-RITE® GAGING MACHINE • GANDY—TIE PULLER and INSERTER

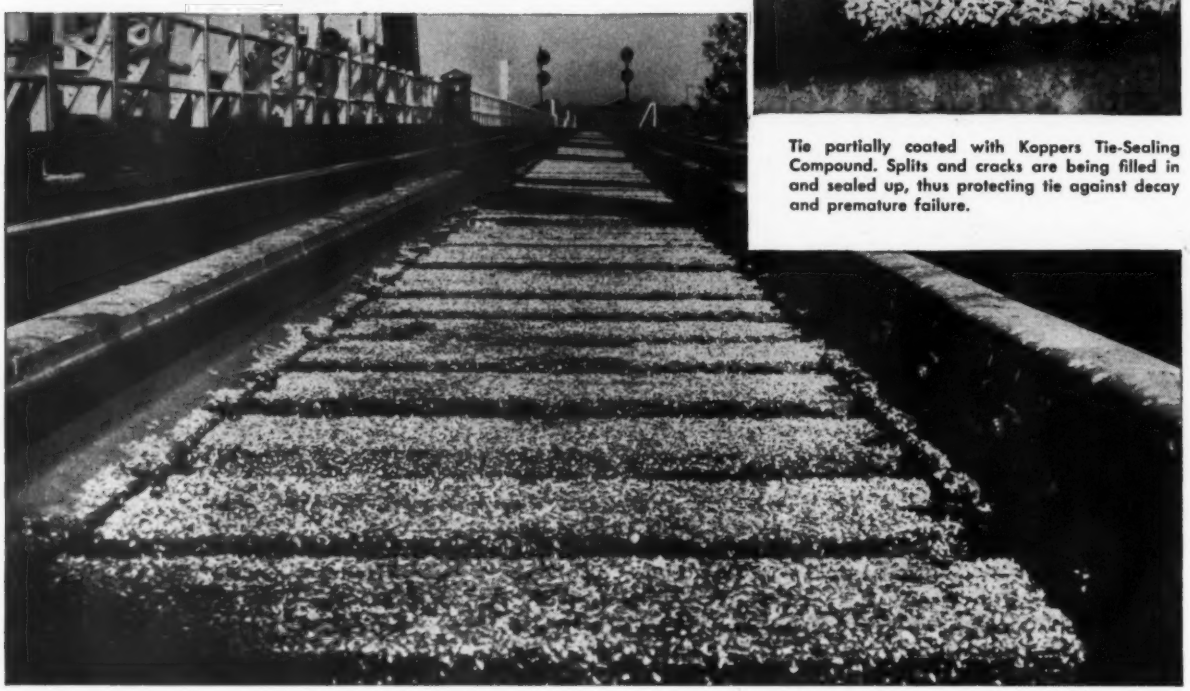
NORDBERG MFG. CO., *Milwaukee, Wis.*

NORDBERG MACHINERY

Prevent premature tie failure with Koppers Tie-Sealing Compound



Tie partially coated with Koppers Tie-Sealing Compound. Splits and cracks are being filled in and sealed up, thus protecting tie against decay and premature failure.



Koppers Tie-Sealing Compound is adding years of service to these bridge ties. Covering of fine stone provides a tie surface that is well protected against the danger of costly fire.

To FIND OUT exactly why ties fail prematurely, a leading railroad recently studied 400,000 defective ties. The conclusion: *over fifty per cent* of the ties which failed were victims of mechanical damage and weather . . . primarily splitting or plate cutting.

This is proof that Koppers Tie-Sealing Compound is badly needed. This specially-processed coal-tar coating fills in and seals up the natural checks and splits in the tie and prevents further splitting and checking. Unless thus protected, grit, ice formations and weathering, accentuated by the impact of heavy traffic, make these openings grow larger and deeper to bring on premature failure.

Koppers Tie-Sealing Compound reduces the number of casualties resulting from plate cutting. It forms a protective barrier around the tie plate—a barrier that keeps out grit and other foreign matter that accelerate the tie-cutting action.

Koppers Tie-Sealing Compound is completely compatible with creosote; it "works with" creosote to provide *extra* protection. Based on actual experience, this protective coating will increase the service life of bridge or crossties by at least five years. For full information, write Koppers Company, Inc., Tar Products Division, Pittsburgh 19, Pennsylvania.

DETAILS AND PRICE INFORMATION ON REQUEST

KOPPERS® **TIE-SEALING COMPOUND**

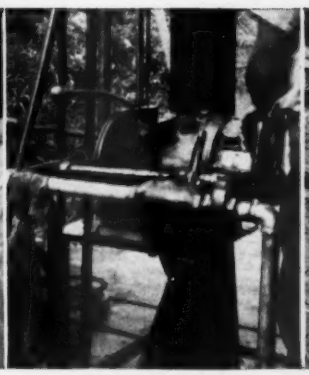
KOPPERS COMPANY, INC.
Tar Products Division, Pittsburgh 19, Pennsylvania

DISTRICT OFFICES: Boston, Chicago, Los Angeles, New York, Pittsburgh, and Woodward, Alabama

Backfill tamping--one of many jobs done fast with Gardner-Denver Air Tools

Paving Breakers and Sheeting Drivers

Trench Diggers and Clay Spaders



Air Hoists and Air Motors

Sump Pumps — Won't Sink into Mud

Portable Compressors for Construction Jobs of Any Size

Write for descriptive bulletins

GARDNER-DENVER

THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

Gardner-Denver Company, Quincy, Illinois

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THE *MIRACLE* MACHINE THAT DOES

3 JOBS *in* ONE!

KERSHAW BALLAST REGULATOR SCARIFIER and PLOW

THE Kershaw Ballast Regulator Scarifier and Plow is the ONLY machine with multiple uses in the Southern Railroad reconditioning gang featured recently in the editorial pages of Railway Track And Structure.

While other machines were assigned only one job, the Kershaw Ballast Regulator, Scarifier and Plow was assigned the three separate jobs shown at right.

The versatile "Regulator" does three times as much work and provides three times as much service for your money. In addition, it performs ELEVEN other jobs. If you haven't tried it already, write for a free demonstration today.

A *3 RING* PERFORMANCE

1. FIRST JOB—Scarifying, breaking mud pockets, plowing old ballast from the tie ends, shaping, regulating and distributing ballast.
2. SECOND JOB—Distributing and placing ballast ahead of the tamper after the ballast has been unloaded.
3. THIRD JOB—Regulating, shaping and finishing the ballast shoulder after tamping.

Recognize This Symbol of Leadership

KERSHAW MANUFACTURING CO. INC.

MONTGOMERY K ALABAMA

News Notes

. . . a resumé of current events throughout the railroad world

RAILWAY
TRACK and STRUCTURES

JUNE, 1955

Average hourly pay for Class I railroad employees, other than executives, officials and staff assistants, was $1.91 in 1954. This was a nickel more than the 1953 average and a dollar more than the average in 1945.

•

The estimated net income of Class I railroads, after interest and rentals during the first three months of 1955 was $155 million, up $83 million over the same period last year.

•

Purchase of another high-speed streamlined train has been authorized by the New Haven board of directors. The new train, to be built by the Budd Company at a cost of $1,200,000, brings to three the total number of new trains being ordered by that road.

•

The Nation's railroads and the Brotherhood of Railroad Trainmen have agreed on a graduated rate of pay for conductors and freightmen working on freight trains of 81 or more cars. Effective date is June 16.

•

The world's rail speed record has fallen again, this time with the French National Railroads breaking their own record set in February 1954. An electric locomotive, pulling three passenger cars, set the new mark of 207 mph, 55.4 mph above the previous record.

•

"Charge-a-plate" credit now available for passengers traveling on or via the New Haven to any destination. The new cards will be honored for rail or Pullman tickets purchased at any New Haven ticket office for meals and refreshments in dining and grill cars and for baggage charges, excepting redcap fees. They also will be accepted for Hertz or Avis automobile rentals.

•

It has been reported that the General Motors Corporation's lightweight train, oft-rumored but never described, was actually tested on a large western road during the latter part of April. Spokesman for the General Motors Truck & Coach Division, to which development of the train is attributed, have consistently refrained from comment about the train.

•

"Piggyback" handling of military explosives was tried out recently in a test movement on the Chicago & North Western in cooperation with the offices of the Chief of Transportation and the Chief of Ordinance, U. S. Army. The 300,000-lb shipment moved in the trailer-on-flat-car service from Baraboo, Wis., to Chicago. The move is expected to point to a new flexibility in shipment of military explosives, while at the same time eliminating hazardous handling over highways.

•

The report of President Eisenhower's advisory (cabinet) committee on transport policy and organization has been endorsed by the Board of Directors of the AAR as "an important contribution toward working out to the best interest of the public, the changes in transportation policy which are made necessary by changed competitive conditions." The Executive Committee of the American Trucking Associations called the report "an economic booby trap for small business," and said that it "supported familiar proposals advanced for years by the railroads in their own interest."

ANYTIME...ANYPLACE!

There's just one big reason why you see so many dependable Homelite gasoline engine driven pumps on the job today. They can be put to work quickly with the minimum of time and effort. Only one man is needed to carry the complete unit to the best pumping location.

There are many other good, money saving reasons why you should put a Homelite pump on your job. Ask your Homelite dealer for a free demonstration or write us for information.

HOMELITE CORPORATION

206 RIVERDALE AVENUE • PORT CHESTER, N.Y.

PROJECT: Nyack-Tarrytown Bridge

CONTRACTOR: Construction Aggregates Corp.

More "Big Machine" Features

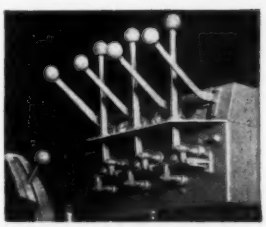
on the MICHIGAN C-16

than on any other ½-yard crawler!

This is a fact: more "big machine" features are *standard equipment* on the MICHIGAN C-16 than on any other ½-yard crawler. It will pay you to look underneath — look inside to see how much more you get for your money.

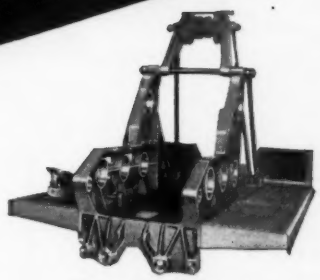
This machine is built for quality-conscious users—for bigger yardage, bigger tonnage, and substantially lower maintenance. The C-16 invites a feature-by-feature comparison with other same-capacity machines.

Write for detailed literature on this ½-yard crawler with big machine features and durability. Or contact your local MICHIGAN distributor. Like all MICHIGAN machines, the C-16 is available on a low-cost Lease Plan—details available.



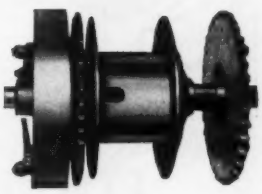
Power Control Independent Travel

Air Controls are standard on all MICHIGANs . . . fast, smooth, precise, with low operator fatigue. Independent Travel is also standard . . . move up while hoisting, swinging, or dumping.



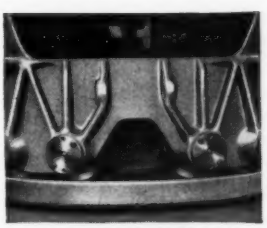
Cast Steel Deck

This feature is usually found only on 1-yd or larger machines. C-16 deck is one-piece, alloy steel casting . . . side frames, boom foot lugs and roller brackets are cast integral. No misalignment!



Power Load-Lowering

Four shafts on the C-16: Swing, Hoist, Travel and Crowd . . . each with its independent clutches. For precision crane work, the hoist line can be reeved on the front drum to provide Power-Up and Power-Down.

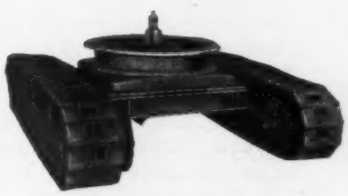


Six Hook Rollers

You can swing the boom just by leaning against it. There are 6 ball bearing-mounted adjustable hook rollers on the C-16 . . . grease twice a year. Most other ½-yd machines have only 3 or 4 rollers, bushing-mounted.

Smooth Clutches

There's nothing smoother than MICHIGAN air-operated segmented disc clutches . . . and they are self-compensating for heat, self-ventilating and self-cleaning. All segments are interchangeable.



Cast Steel Car-Body

Circle gear, with hook roller paths, internal gear teeth, center post, and crawler drive gear case is cast integral. Standard alloy steel tracks are 20″ wide, 9′10″ long. Swamp pads are optional: 30″ wide, 11′10″ long.

CLARK EQUIPMENT

CLARK EQUIPMENT COMPANY, 492 Second Street, Benton Harbor, Michigan. (29A)

Construction Machinery Division
Phone: WA 6-6184

Please send literature:

☐ C-16 Detailed Bulletin

☐ MICHIGAN Lease Plan Bulletin

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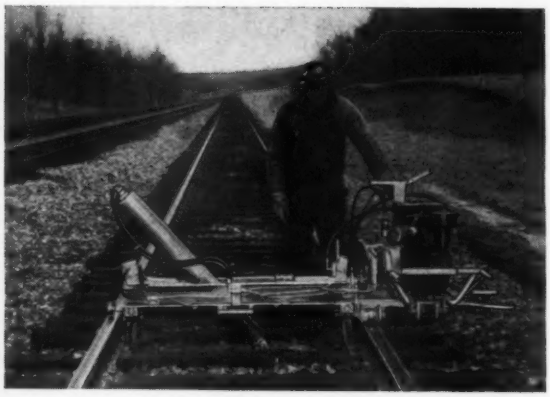

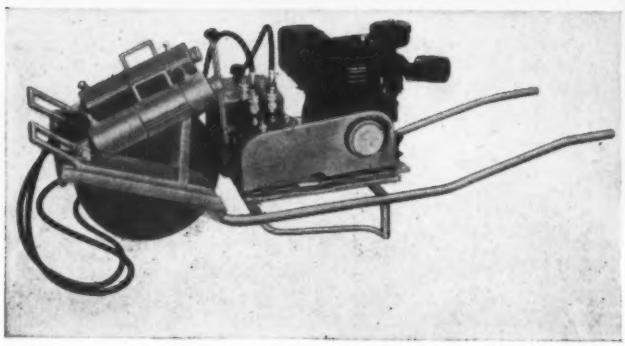

Upper left—Model P-O, gasoline engine powered Hydraulic Track Liner operating two hydraulic rams.

Upper right—Model P-O gasoline engine powered Hydraulic Track Liner operating attachment with double flanged track rollers, adjustable for any height and weight of rail.

Lower left—Model P-O gasoline engine powered Hydraulic Track Liner and two hydraulic rams mounted on wheelbarrow type frame that can easily be operated or transported by one man.

Lower right—Model H-O Hydraulic pump, light weight, hand operated, that will supply power for one (as shown) or two rams. Ideal for small gangs.

RTW HYDRAULIC TRACK LINER

More track lined per hour with Minimum effort and expense

The RTW Hydraulic Track Liner—Model P-O—was devised and designed by railroad engineers thoroughly familiar with maintenance of way problems.

A light rigid self contained attachment with double flanged rollers used with the P-O Track Liner adjusts to any height or weight of rail. It supports a portable air-cooled 8 horsepower gasoline driven engine. This power plant can be used with two hydraulic rams for lining thru switches, road crossings, etc., as well as supplying power for the attachment for out-of-face lining. Its light weight and portability reduces operator fatigue.

This equipment is also available mounted on a wheelbarrow type frame that can be transported by one man for use in heavy traffic areas.

The hand operated hydraulic pump, available with either one or two hydraulic rams, is ideal for spot lining with small gangs.

The interchangeable units of these highly portable power operated Hydraulic Track Liner combinations afford a smaller force, the equipment necessary to do the work that normally would require heavier oversized machines and a large crew.

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Railway Track-work Co.

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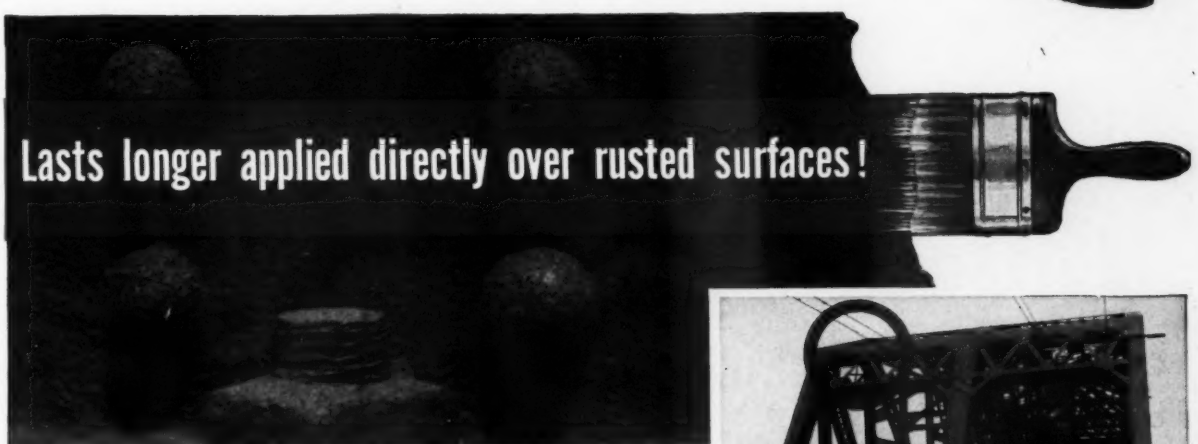

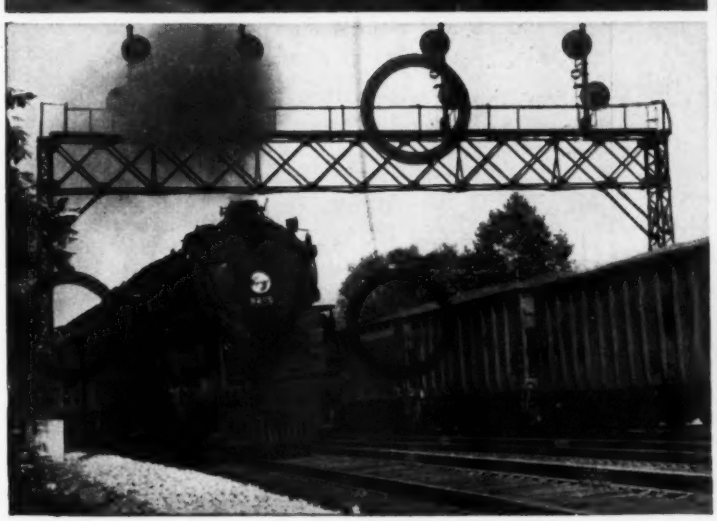

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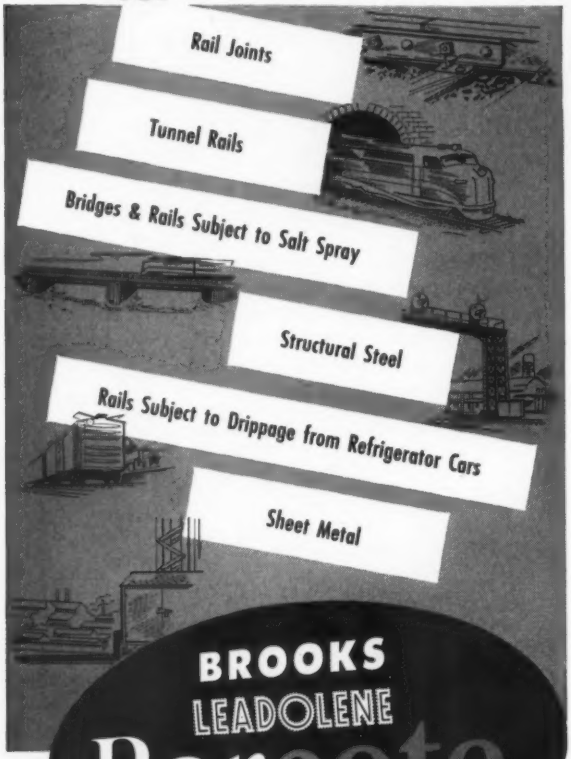

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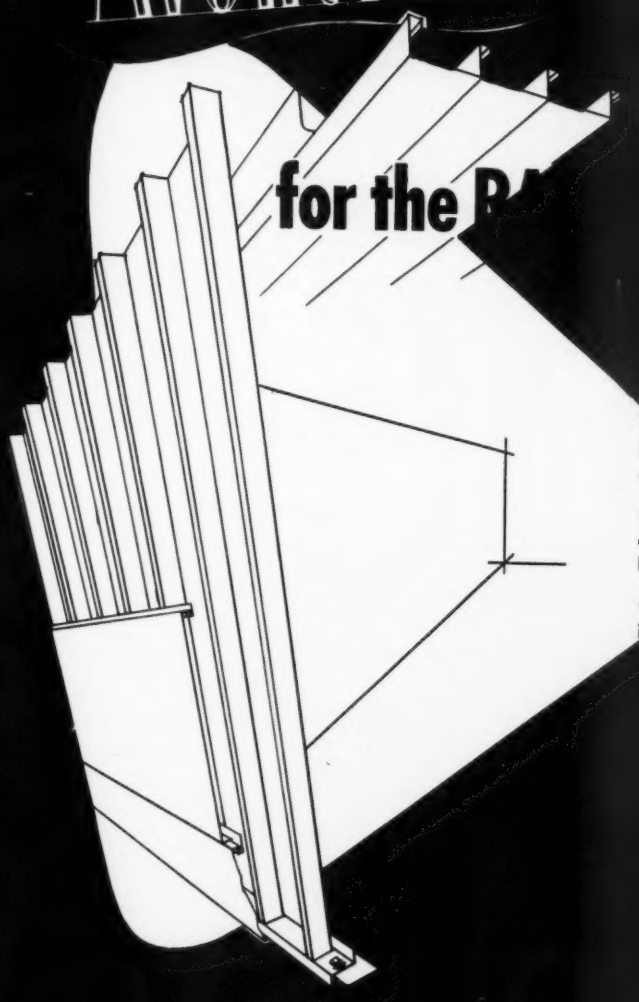

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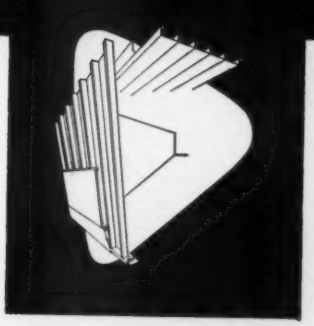

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50th Anniversary of
AMERICAN CREOSOTING COMPANY
Pioneers in Forestry as well as Wood Treatment

. . . for Lower Cost, Longer Lasting Wood Products

It has been estimated that the modern wood preserving industry, pioneered by the American Creosoting Company, has saved the nation the equivalent of 500 million acres of forest lands in the past 50 years. Great as this force has been, wood preservation alone was not enough to stem the tide of forest exhaustion. Additional measures were needed to extend the life of our forests and assure the nation of a plentiful wood supply.

The greatest conservation force is, and must continue to be, the forester and his science of forestry. Reduced waste of timber gave him the chance to prove that good forestry practices will win the battle against depletion.

Just as it was the pioneer in wood preservation, American Creosoting Company was a pioneer in forestry. While the science of forestry was in its infancy, American Creosoting Company took a practical interest in the advancement of the science by purchasing large forest areas to make them available for the study and advancement of the practices of good forestry.

In this vast woodland laboratory, known as Satilla Forest, Amcreco has helped develop and carry out many of the scientific practices that are now in widespread use throughout private, industrial and government owned timber lands. Satilla forest is known and recognized by authorities as an outstanding example of forestry management. In addition to serving as a laboratory for the development of man's knowledge in forestry, Satilla has also provided Amcreco with a great amount of fine timber for treated poles, cross arms and other construction woods.

Hand in hand with its experiments in forestry, the American Creosoting Company has helped develop wood preservation to the fine art that it is today. The results of these efforts — wood, pressure treated in creosote by Amcreco, lasts for years and years with great strength throughout the life of the wood, and under many conditions, wood treated by Amcreco can be considered essentially permanent.

If you've never been an Amcreco customer — if you've never profited by our years of experience, strategically located treatment plants and sales offices, contact us on your next job. We would appreciate an opportunity to quote on your needs.

This year the United States Forest Service also celebrates its 50th anniversary. We are proud to share our birthday cake with them and to join the nation in thanking them for their invaluable contributions to conservation.

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The photographs above tell a bright story of crossing safety 24 hours a day! Reflecting light from approaching autos, crossbucks of "Scotchlite" Sheeting can be seen from ½ mile away at night, giving clear warning of a grade crossing ahead. The smooth, easy-to-clean surface of "Scotchlite" Sheeting gives years of trouble-free service . . . and it stays vivid and bright, always, with a minimum of field maintenance.

Leading railroads throughout the nation are switching now to efficient grade crossing and roadway signs of "Scotchlite" Sheeting. And they're doing it through the central sign shop plan. With one shop, a railroad with a vacuum applicator to bond "Scotchlite" Sheeting to the sign backing can economically reflectorize its entire system. This easy, system-wide change-over is just one more example of the efficiency and economy a central sign shop can bring your road.

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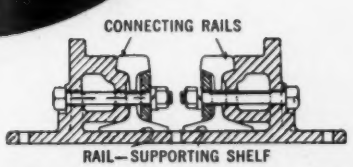
Yes, the Universal Frog for yard service is built better 4 ways . . .

1. It is made of an alloy electric cast steel that adapts itself to low cost electric or oxy-acetylene welding in track or shop.

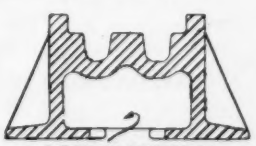
2. Tie plates are cast integral with the Universal Frog—an exclusive!

3. Rail supports are cast integral on both ends of the Universal Frog —another exclusive!

4. One-piece construction — no loose joints. Eliminates extra parts and cuts down maintenance costs.



HERE'S PROOF: Compare the cross sections of the Universal Frog with conventional types. Note the improved type rail joints, the patented supporting shelf, integral tie plates and rib construction.



LFM

THE L.F.M. COMPANY

RAILWAY
TRACK and STRUCTURES

Subject:

Dear Readers:

Supply Man's Dream

We suspect that railway supply men sometimes have a dream that goes something like this: The demand for their products is so great that they are being wined and dined by their railway customers, who are hoping thereby to win preference over rival buyers in getting early delivery of needed supplies.

Pretty far-fetched, we say. It's only a dream, and dreams seldom, if ever, come true. Something like this might happen during war time, but never when the world is at peace, even if the prevailing international situation is that described as a "cold war"—so our reasoning goes.

But let's not be too sure that the dream represents a situation that couldn't possibly come true. We—and by that I mean most of us—have gotten into the habit of believing that the railroads are destined to go through the years struggling against great odds for every ton of traffic and that consequently the railway supply companies must also struggle for every order for their products. With this situation fixed firmly in our minds it is difficult to picture the railroads as having more business than they can conveniently handle and the supply companies as having more orders than they can fill.

Imagine, therefore, the reaction of a group of railroad and supply men recently when they heard an economist predict that conditions such as those pictured in the dream would come to pass—and soon. The occasion was a regular monthly meeting at Chicago of the Western Railway Club, and the speaker was Eliot Janeway, who is noted as an author as well as an economist.

Mr. Janeway startled his audience by the prediction that "next year will see railroads worrying about where equipment is coming from, not traffic." He went on to say that "the 1955-56 revival of railroad buying will come as a dramatic and familiar recovery from famine to feast conditions. But this time the feast will not be short-lived."

He is convinced that "the boom about to be showered upon them (the railroads) will be marked by a sustained prosperity in this country and intensified crisis abroad." The prosperity will come about, he believes, because renewed industrial construction will be "loaded on top of construction which is already straining our facilities of credit, equipment and manpower. Heavy construction of this kind is the most potent single source of railroad traffic. If sustained—and it will be sustained—it will force railroads to buy and borrow."

These are dramatic words. The railroads are now enjoying a moderate degree of prosperity, and plenty of people are expecting these conditions to continue for some time to come. Few of them, however, go as far in their thinking as Mr. Janeway. On the other hand, who is to say that the conditions he foresees cannot happen? Is there significance in the fact that a number of supply companies in the M/W field are already straining to fill a sudden influx of orders? Maybe that dream isn't so far-fetched after all.

MHD

PERMITE ALUMINUM PAINT

lengthens bridge life for New York Central System

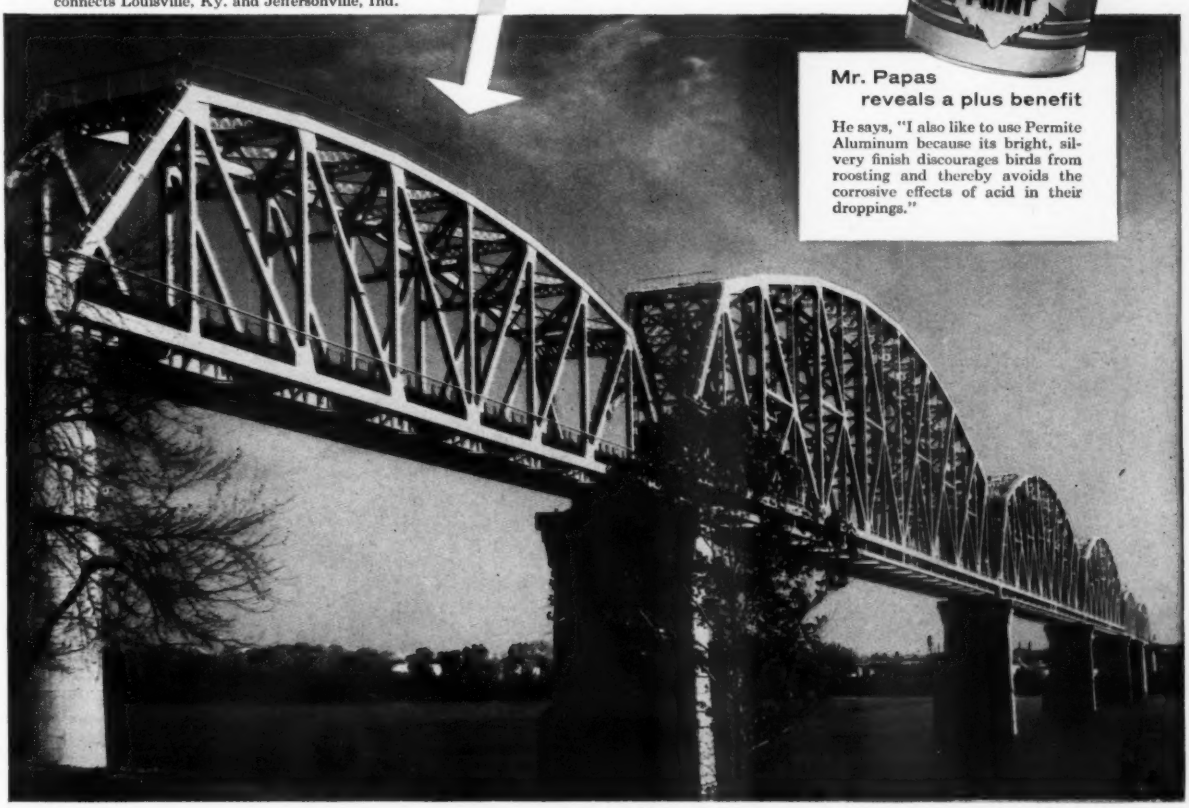
When S. S. Papas, president of the Republic Structural Painting Corp., Cincinnati, Ohio, was awarded the contract to repaint the New York Central's L & J Bridge, he chose Permite Aluminum Paint to meet Railroad Specifications for the job. Experience through the past 25 years (during one year of which time he painted 106 bridges for the New York Central, alone) has proved to Mr. Papas that Permite Paint gives *more* years of protection for buildings, bridges, and equipment.

There's a reason for Permite's added protection and longer life—"Permium." This stabilizing ingredient in the Permite vehicle causes the paint to leaf faster and more completely. Thus you get a thicker metallic coating of aluminum with Permite than with any other paint.

FOR A QUARTER OF A CENTURY, Permite has been safeguarding America's industrial properties, producing lower maintenance costs and greater savings.

Orders filled quickly from distributor stocks located throughout the United States. Catalog and prices sent promptly on request.

The L & J Bridge: 4,300 gal. of Permite Aluminum Paint were used to beautify and protect the 18,080 tons of steel in this great railway bridge, owned by the N. Y. Central System. Over two miles in length, it connects Louisville, Ky. and Jeffersonville, Ind.



Mr. Papas reveals a plus benefit

He says, "I also like to use Permite Aluminum because its bright, silvery finish discourages birds from roosting and thereby avoids the corrosive effects of acid in their droppings."

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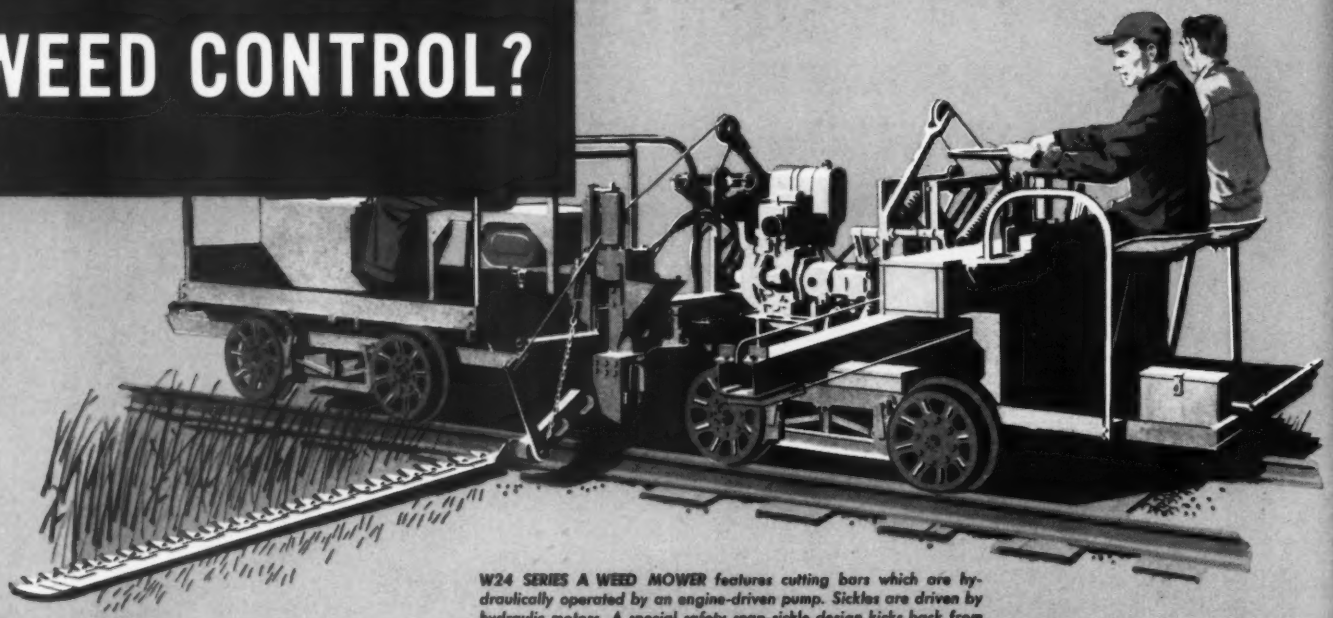
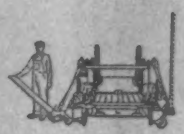
IS YOUR PROBLEM WEED CONTROL?



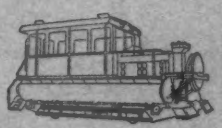
W24 SERIES A WEED MOWER *features cutting bars which are hydraulically operated by an engine-driven pump. Sickles are driven by hydraulic motors. A special safety snap-sickle design kicks back from obstructions and resets automatically. Swaths can be changed without stop. Can cut up to almost fifteen feet on either side of track centerline.*



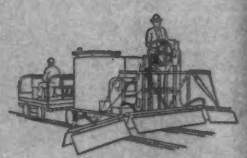
M5 SERIES A WEED MOWER *provides fast, efficient cutting at minimum cost. An automatic cutter bar release, heavy-duty sickles and clutch-equipped engines highlight its performance characteristics.*

W44 SERIES D WEED BURNER *is a tow unit designed for short lines and limited burning. Two outer burning arms are counterbalanced for easy operation. Unit can be operated entirely from within cab.*

W55 SERIES B WEED BURNER *is an unusually thorough and efficient weed killer and snow melter. Burner heads can be positioned quickly and easily. Flame reaches vegetation regardless of roadbed contour.*



W66 SERIES B WEED SPRAYER *is a self-propelled unit fitted with two sets of differently sized nozzles which may be used together or separately. Minimum crew. Three-speed, two-way drive with fluid coupling.*



W78 SERIES A WEED SPRAYER *is a trailer-type unit which applies liquid weed killers. Lightweight, compact, low cost. Features include a two-cylinder engine, 800-gallon tank and eleven-nozzle spraying action.*

You'll find the answer at Fairmont

If weed control is one of your maintenance problems, we know you will want to give careful consideration to the Fairmont products pictured above. For they represent Fairmont's finest answers to virtually every weed control problem with which you might be confronted. Regardless of the method best suited to your needs . . . regardless of the amount of service you might require of your equipment . . . and regardless of the investment you are able to make . . . you will find the answer at Fairmont! And in choosing Fairmont, you will be assuring yourself of the finest in design . . . in craftsmanship . . . in dependability . . . and in economy of operation. For these qualities are *standard equipment* in every product that bears the famous Fairmont name plate. Truly, in the field of weed control, as in every other area of maintenance operation, Fairmont stands pre-eminently alone . . . and offers still further proof that Fairmont is your finest source for every maintenance need.

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RAILWAY

TRACK and STRUCTURES

June, 1955 **Vol. 51, No. 6**

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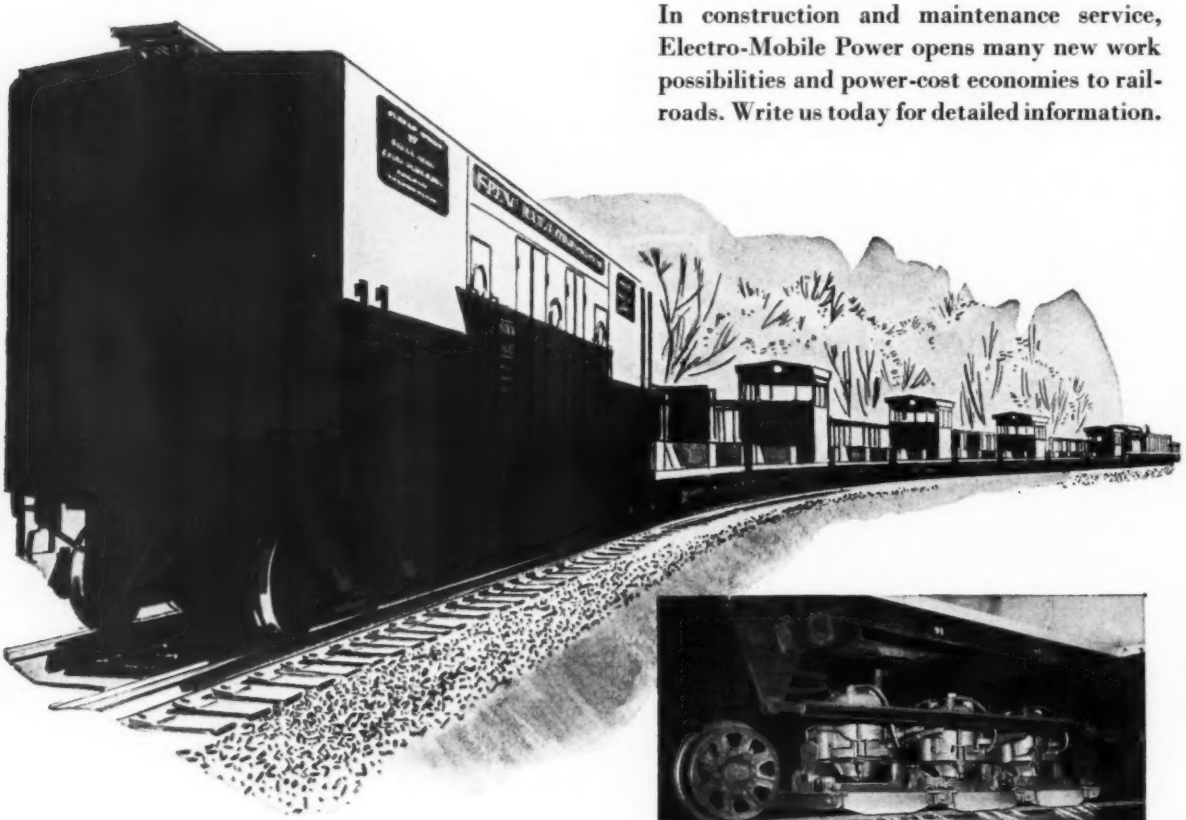

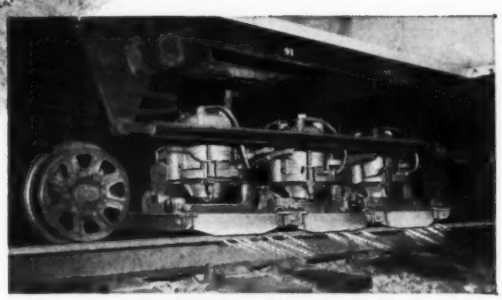

The 750 kw. Electro-Mobile Unit powers these multiple Speno Rail Grinders

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Open Minds Needed Here

It is getting to be common procedure these days for M/W officers to visit other lines for the purpose of inspecting their methods and practices. This is a good sign. An eagerness to see what the other fellow is doing and a willingness to adopt his practices for your own use if they are superior, are indications of a healthy desire for improvement.

But before we get too loud in praise of this practice let's consider for a moment one of the less commendable human traits—one that is inclined to rear its ugly head in situations of this sort. We can best describe it by recounting the recent complaint of a top M/W officer of a road known for its advanced practices. In a disgusted manner he was telling what happened when a representative of another road came to inspect his practices.

"We went out of our way," he said, "to give the visitor every opportunity to see what we were doing. But he just wasn't interested. His inspection of operations on the ground was extremely superficial, and when we took him for a ride on a regular passenger train on our main line, what do you suppose he did? He read a book all the way!"

We are certain this is an extreme example, but for that reason it illustrates the point with emphasis. These visits to other lines are made for a definite purpose—to see how work is being done and to determine if the practices can be adopted with profit on the visitor's own road. For that reason we need to avoid a scoffing or negative attitude. A person with such a viewpoint is, in effect, saying to himself: "I know this won't work on my road, and I am going to prove it won't." Anyone with this attitude cannot possibly make an unbiased report of what he sees and hears. As a consequence he will be depriving his road of information that might help it to reduce costs or to get improved results in other ways.

Training Track Foremen

What are the basic qualities that a good section foreman should possess? How can they best be developed? A cross section of opinion on these questions, based on the judgment of an extra-gang foreman, a roadmaster, a general roadmaster and an engineer of track, is included in the "What's the Answer" section of this issue.

In general, the answers reflect a divergence of opinion with reference to the length of the training period that is considered necessary prior to qualification. This varies up to a maximum of two years in the case of an assistant foreman and up to five years in the case of a foreman.

There is general agreement that a likely prospect for a foreman's position should serve time under the direction of a foreman who has ability as a teacher. It is also generally agreed that a candidate for the job of foreman should possess several basic traits, including the ability to learn, the ability to get along with other men, the ability to lead and a willingness to accept responsibility.

Individuals with these qualifications are in great demand everywhere. What can a railroad do to induce such men to seek employment on a section or road gang? After he has accepted employment, how long will he be content to work while acquiring the necessary seniority and experience to qualify him for promotion?

Some railroads, endeavoring to realize the full advantages of mechanization of maintenance-of-way forces, have found it necessary to reorganize their entire maintenance set-up, establishing system or district maintenance gangs and eliminating in some instances the section gang.

There is, of course, an obvious need for qualified foremen to head up these new and larger units. This question may be raised: Are present methods of training and qualifying foremen such as to give the best results under the new conditions?

THE TRAIN comprises eight specially-designed grinder cars and a power car. Four of grinder cars are equipped with control cabs, while others are remotely controlled from cab on adjacent car. Locomotive moves train along at about 2 mph.

New Rail-Grinder Train . . .

Takes Off the Rough Spots

Frank Speno Railroad Ballast Cleaning Company builds all-new nine-car train designed to grind the running surface of rail, out of face. As train moves along at about 2 mph, 96 power-driven abrasive wheels, mounted on special truck assemblies beneath cars, grind out corrugations and other surface irregularities on both rails simultaneously. Built at a cost of around $500,000, the train is owned and operated by Speno and is being made available to railroads on a contractural basis.

● "What is that thing?" queried one bystander. "Darned if I know!" replied a fellow sidewalk superintendent as they watched a train of nine odd-looking cars, caboose and engine round a curve amid a shower of sparks and flying dust. As the dust cleared with the passing of the last whirring car, the shiny, polished surface of the rail revealed the answer. The "thing" was a rail-grinding train.

Designed for out-of-face use in removing corrugations and other minor imperfections of the running surface of rail, the train was built and is operated by the Frank Speno Railroad Ballast Cleaning Company, Ithaca, N. Y., a firm well-know for its work in the ballast-cleaning field.

The train is composed of eight specially-built grinder cars and an EMD power car. The grinder cars are an adaptation of similar cars developed by the Pennsylvania, which have been in regular use on that road for a number of years.

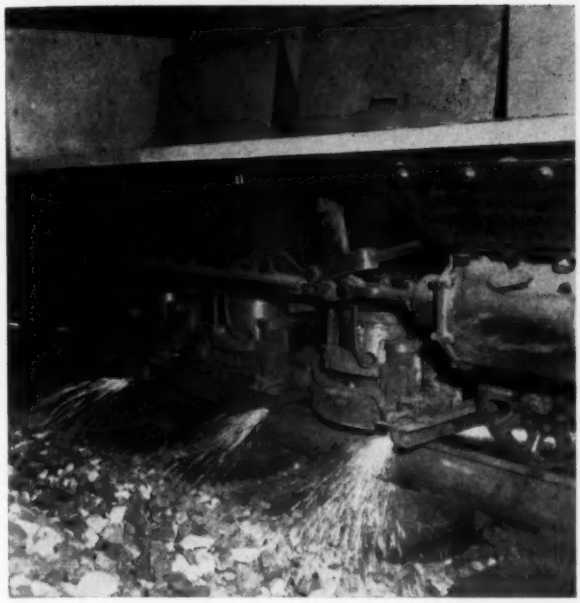
The successful operation of the PRR rail grinder cars, and the apparent need for additional equipment of this type, indicated to the Speno Company that there was a market for commercial development of similar equipment. It was apparent that the expense of building a complete grinder train was the principal deterrent to more widespread use of rail-grinding practice. Frank Speno, Jr., president of the Frank Speno Company, felt that the development of such a train by his company for rental to the railroads offered a logical solution to the problem.

Lackawanna Uses It First

The new train went into service early in March on the Lackawanna and has, since that time, been used on the Lehigh Valley. Other roads are presently contemplating its use on their lines. When our reporter visited the train on the Lackawanna in late March, it was completing out-of-face grinding operations on about 350 miles of main-line track. This mileage had been completed in only 24 days of operation, or an average of about 14½ miles per day.

Most of the grinding on the Lackawanna was done on the road's multiple-track Hoboken-Buffalo line where traffic density is extremely heavy. The train was kept on duty for an average of about 11 hr each day; however, due to the heavy traffic, it was able to spend only about 7 hr per day actually working. The remainder of the time was consumed in going to and from tie-up points and in clearing trains which could not be detoured. The cost of grinding, including rental of the equipment, personnel for operating the cars and

How Grinding Is Done . . .



ABRASIVE wheels, powered by 7½-hp electric motors mounted on special "pony" trucks under cars, grind rail surface.

MOTORS are tipped at angles from vertical to provide various grinding planes and maintain contour of rail head.

the work train to handle the equipment, has been running less than $100 per mile of track.

The practice of rail grinding out-of-face is not new to the Lackawanna since that road has used the Pennsylvania grinder cars during recent years. In the future the road intends to continue a program of rail grinding as necessity requires.

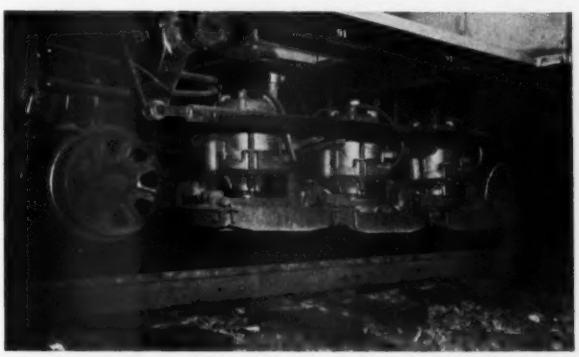
New Rail to be Ground

The Lackawanna plans not only to grind old rail but to grind newly laid rail as well. The purpose in grinding the new rail, according to engineering officers, would be to reduce variations in rail height at joints due to extremes of mill tolerance and to remove mill scale and other minor irregularities in the surface before they have a chance to develop to a more serious degree.

Some of the advantages claimed for rail grinding are: Elimination of irregularities which cause vibration in locomotives and rolling stock and increase the maintenance of such equipment; a smoother ride for passenger trains; reduced rail and joint maintenance; and reduced track maintenance effected by the reduction of vibration. Furthermore, Mr. Speno foresees, through the employment of a cycled program of rail grinding, the possibility of adding considerably to the service life of rail. His reasoning is that, if surface imperfections can be eliminated, or at least held in check so that their development is not so rapid, the life of rail would be extended indefinitely, the actual wear on the head then being the only critical factor.

Cars Built in Speno's Plant

The eight specially-designed grinder cars were assembled in Speno's plant at Syracuse, N. Y. The car underframes and trucks were furnished by the International Steel Company, Evansville, Ind. Each of the cars is fitted with two specially-built "pony" trucks



"PONY" TRUCKS are raised from rail by pneumatic cylinders when not in use. Special locking devices hold trucks in place.

furnished by Fairmont Railway Motors, Inc. These "pony" trucks are suspended from the underframe of the cars and are used to support the grinder motors. There are six Reliance, 7½-hp, 3600 rpm, 440 volt motors mounted on each truck, three over each rail. The motors are arranged in a straight line over the rail but can be tipped at angles so as to provide various grinding planes on the rail-head surface. Each motor powers a 10-in by 1¾-in steel-back grinding wheel.

The "pony" trucks can be raised and lowered from the rails by means of pneumatic cylinders. When not in operation, the trucks are raised and locked into position by pins and toggle levers. The grinder motors are each mounted in a cradle on the trucks and can move up or down in this cradle to give the desired pressure of the stone against the rail surface. This pressure is maintained at a constant level by means of two hydraulic-pneumatic cylinders, one on each side of the motor. Each motor weighs about 300 lb, and if the motors were to bear with the full force of their weight on the rail, the pressure would be too great; therefore, the cylinders on each side of the motor push

Operation of Train . . .

PAGING system permits relaying instructions and warnings of approaching trains and obstructions to train personnel.

TRAIN CREW also maintains communication with engine and grinder-car operators through portable talk-back speaker.

ENGINEER has special speedometer to aid holding 2-mph speed.

upward so as to carry a portion of the motor weight and obtain the correct pressure of the stone against the rail.

During operation, the pneumatic and hydraulic controls for both the "pony" trucks and the grinder motors are handled by four operators. Every other one of the eight grinder cars is fitted with a cab at one end of the car. A control panel in each of these cabs provides pneumatic and hydraulic controls for raising and lowering the trucks and motors, and electrical-circuit controls. Each operator regulates the grinder assemblies on a cab-equipped grinder car as well as on the "idler" car immediately ahead, which has no cab.

Each of the control panels has 24 ammeters and a like number of air-pressure gages, one each for all the grinder motors operated from that panel. By watching the ammeters, the operator can determine whether each grinding stone is bearing with the correct pressure against the rail surface. It has been determined that, when the motor is drawing about 6.9 amp of current, the grinding is most effective. By adjusting the pneumatic-hydraulic pressure in the cylinders supporting each motor, the operator is able to maintain the desired 6.9 amp of current to each motor.

If the ammeter reading on a particular motor should go up to say 7.5 amp, then the operator opens the air valve to the cylinders on that motor, thereby raising the unit slightly, reducing the pressure of the grinder wheel against the rail and lowering the current consumption of the motor. If the reading should become too low, then the pressure on the cylinder supporting the motor is reduced, thus increasing the bearing of the wheel against the rail and increasing the current load of the motor.

The air-pressure gages on the control board also serve as a means of indicating whether the grinder wheel is operating at the desired pressure against the rail surface. It has been found that when an air pressure of about 20 psi shows on the gage, the stone is bearing at the proper pressure.

How Head Contour Is Maintained

To obtain the desired head radius when grinding, the six grinder motors over each rail on each car are set at different angles with reference to the vertical plane of the rail. The motor grinding nearest the gage side of the rail is tilted at the greatest angle from vertical and the motor grinding at the point nearest to the center of the rail head is in a vertical position. The other four motors are tilted at angles between these two extremes. Hand cranks are provided on each grinding unit to adjust them to the desired angle. With this arrangement on each car, and with a total of eight cars, it can be seen that there are a total of eight motors on each rail throughout the train which are grinding in the same plane.

The total metal removed from the rail surface as the train passes is somewhere between 0.008 and 0.10 in. Two general types of grinding stones are used, one with coarse grit for removing metal rapidly, and the other with a fine grit for finishing. To permit the train to be operated in either direction, the coarse-grit stones are located on the center grinding cars while the cars on each end are fitted with the finer finishing stones.

The train is moved along at about 2 mph which has been found through past experience to be the most effective speed. At higher speeds insufficient metal is removed to eliminate imperfections in the rail surface, and at lower speeds too much metal is removed. The hydraulic and pneumatic control mechanisms are all

Power, Control System . . .

POWER CAR, placed at one end of train, furnishes electricity and air for operation of grinder cars.

CONTROL PANELS in cab-equipped cars have valves and gages for use in operating grinder assemblies.

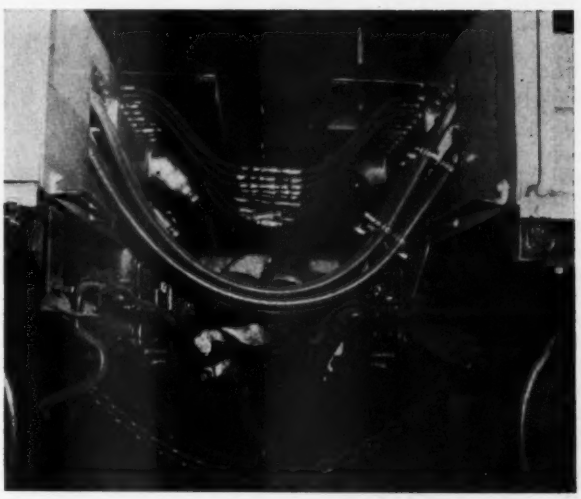
set up so that, if the speed of the train falls below 0.9 mph the grinder wheels are automatically lifted from the rail. This is a safety precaution to prevent the stones from actually grinding a hole in the rail head in case the train is stopped without warning. To permit the locomotive engineer to maintain the desired 2-mph speed, a special portable speedometer, calibrated from 0 to 5 mph is installed in the locomotive cab. The speedometer is activated by a tachometer generator attached to a "pony" truck of the grinder car nearest the engine.

Additional Men for Lookouts

In addition to the four operators stationed in the control cabs two operators are on duty on the ground at all times. These men walk along the train looking for any mechanical troubles and keep an eye out for road crossings, switches, rail lubricators, etc., and give signals for raising and lowering the grinder motors when passing over these obstructions. These men also "lock up" the grinder assemblies when grinding operations are to be suspended for any reason. The railroad furnishes one man, in addition to the train crew, for supervision of the grinding operations. All other personnel are furnished by the Speno Company.

Electrical power for operating the grinder motors, as well as compressed air for operation of the various pneumatic mechanisms, is furnished by the EMD power car. This car, which looks very much like a "B" road-locomotive unit, contains a 12-cylinder diesel engine which powers a 440-volt, 750-kva main generator, a 440-volt, 25-kva auxiliary generator and a Gardner-Denver air compressor. One section of the car is devoted entirely to electrical control panels.

The power car is situated at one end of the string of grinder cars and electrical power cables and compressed air lines extend through the entire train. Connections between cars are provided by flexible cables and hoses. Electricity and air from the main lines extending to the power car are supplied directly to the control cabs on each of the four control cars, then distributed to the grinder assemblies on the cab cars and to the remotely-controlled "idler" cars ahead. Electrical and pneumatic connections between the cab cars and their respective "idler" cars are also provided by flexible cables and hoses.



FLEXIBLE hoses, cables transmit air, electricity between cars.

The entire train, including the engine and caboose, is equipped with a paging-speaker system with microphones and speakers mounted inside each control cab, and speakers on the outside wall of each cab. The caboose and engine are each supplied with a portable talk-back speaker unit. Instructions to the various grinder-car operators and train and engine crews and warnings of approaching trains, obstructions and the like are relayed over the speaker system. For night operations adjustable floodlights are mounted on both ends of each cab.

The operator cabs have large windows, double glazed with Duplate safety glass, on all sides. The extensive use of glass in the cabs permits the operators to observe operations all along and on both sides of the train. The cabs are fully insulated throughout and each is equipped with a Fedders air-conditioning unit and a Chromalox electrical heater. Lighting on the inside of each cab is furnished by an overhead incandescent fixture and, to eliminate glare at night, a desk-type fluorescent fixture above each control board. Each cab also has a steel work bench with a vise and shelves to use for general repair work and the storage of spare parts.

Debut on The Santa Fe . . .

Flash Butt-Welding For Rails

Process developed in Europe and now adapted for use in this country is currently producing continuous rails on the Santa Fe. The road plans to weld a total of 63 track miles of continuous rail by this process in 1955.

MOLTEN METAL, slag and other impurities are blown from rail ends under pressure of gases created by volatilized metal during flashing process.

● An event of historic interest to railroad maintenance of way men occurred at Albuquerque, N. M., a few weeks ago. The Santa Fe began fashioning rails into continuous lengths using a new version of the electric-flash butt-welding technique as developed and introduced in this country by the Matisa Equipment Corporation, Chicago. It is known as the Matisa-Schlatter process and is adapted from a method originally developed in Switzerland and widely used in Europe, particularly Germany.

Marks Large-Scale Program

Another significant aspect of the Albuquerque event is that inauguration of the Matisa-Schlatter process marks the second year on the Santa Fe of a large-scale program of laying continuous-welded rail when making rail renewals. Last year the road laid a total of 38.7 miles of such rail, all fabricated by the Oxweld oxyacetylene pressure welding process. This year 103 track-miles of these long rails have been authorized, 63 of which will be fabricated by the Matisa-Schlatter process, and 40 by the Oxweld method.

Of the rail to be flash-welded, the first 27 miles will be placed in track on the Santa Fe's main line between Rosario, N. M., and Bernalillo on the New Mexico division. The rails for use in this territory are being welded at Albuquerque. The equipment will then be moved to Waynoka, Okla., for welding about 7½ track-miles which will be installed between Curtis and Mooreland, Okla., on the Plains division. Finally the equipment will be moved to Chillicothe, Ill., to weld slightly more than 28 miles to be laid between Edelstein, Ill., and Knox on the Illinois division.

A Three-Car Set-Up

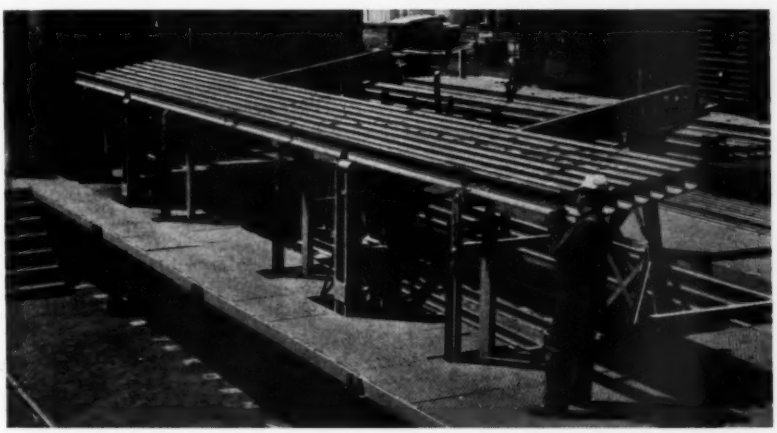
Development of the Matisa-Schlatter process is the outcome of many months of intensive effort to adapt the Swiss version of the electric-flash method to use in this country, and especially to develop equipment of the required mobility. The equipment developed is permanently housed in three specially designed all-steel box cars. These cars serve a dual purpose; they house the welding set-up when it is in operation and provide the necessary mobility. The cars contain:

(1) The power plant used for generating the necessary electrical power for the welding process, and such additional power as is necessary to operate the various motors and lighting facilities required during operation.
(2) The welding unit, an air compressor and a water-cooling unit for cooling the welding electrodes.
(3) The grinding machines and a winch for moving the welded rail.

At Albuquerque the welding equipment is arranged on two tracks, with the welding and grinder cars on one track and the power car spotted on the second directly opposite the welding car.

Portable, car-floor height, platforms are provided between the cars, between the grinder car and the inspection building, and completely around the rail-feeding ramp. These platforms, the decks

BURRO CRANE unloading rail into stock piles at welding site. This crane also keeps the rail-feeding ramp supplied with rail for use on the welding line.



RAIL-FEEDING RAMP has capacity of 20 rails. Ramp operator feeds rails from ramp to the welding line. Here a rail is ready to move to welding machine.

of which are constructed of steel checker plate, give easy access to any point on the welding line and are provided with stairs to the ground level.

Production Sequence

The fabrication and finishing of the welded rail is carried out at six stations located along the line, namely, receiving, end cleaning, welding, base grinding, head grinding and inspecting. Two men—a crane operator and his helper—move rails from the stockpile to the rail-feeding ramp with a Burro crane. This ramp consists of two lines of beams placed at right angles to the welding line on a slight downward slope. A continuous drag chain, operating in a channel attached to the top of the supporting beams, brings the rails latterly from the upper end of the ramp to a position against stops adjacent to the welding line. The chain is air-actuated and is controlled by an operator stationed at the lower or welding-line end.

When a rail is required on the welding line, the feeding-ramp operator actuates an air-operated device which raises two metal fingers that extend under the rail adjacent to the stops and lift it above the stops. The rail then slides down the fingers onto the rollers at the beginning of the line. From this point the rail travels longitudinally.

When a rail has been placed in position to move down the production line, the front-end face and the adjacent electrode-contact surfaces on the head and base of the rail are cleaned by the feeding-ramp operator. He also cleans the back end of the preceding rail. This is done with a sanding machine which is used lightly to remove mill scale and dirt. The rail ends to be joined then move into the welding machine.

This machine has been specially designed for flash welding of railroad rails by H. A. Schlatter Ltd., Zurich, Switzerland. This company is reported to be the largest European builder of specialized electric-welding machines. The welding machine is fully automatic, once the welding process has started, with combined hydraulic and pneumatic actuation. It is said to be capable of welding mild and carbon steels up to a maximum cross section of 15.5 sq in., which is in excess of the area of the largest T-rail now rolled. The machine is reported to have a capacity of 10 to 15 welds per hour depending to a large extent upon the uniformity of the rails. Single-phase electrical power for the welding operation is furnished at 640 volts, 40 cycles from a Brown Boveri generator.

In the welding operation the forward rail in the welding machine is moved ahead until its back end is 6 in on either side of the center of the welder. The following rail is then fed into place with its front end against the back end of the forward rail. The operator then centers the joint in the welding machine. This is done by moving the welding machine which is mounted on small wheels operating on a track in the machine base. It is moved with the aid of hydraulic ram controlled by the welder operator. After the machine is exactly centered, the rail ends are alined and clamped in platens both vertically and horizontally. The platen holding the forward rail is fixed while the platen holding the following rail is movable. The electrodes are then applied to the rails and the welding operation is ready to start.

Welding Done in Four Steps

The welding is done in four steps —preheating of the rail ends, flashing, upsetting and current interruption. The first step may be either automatic or semi-automatic. The final three steps are fully automatic.

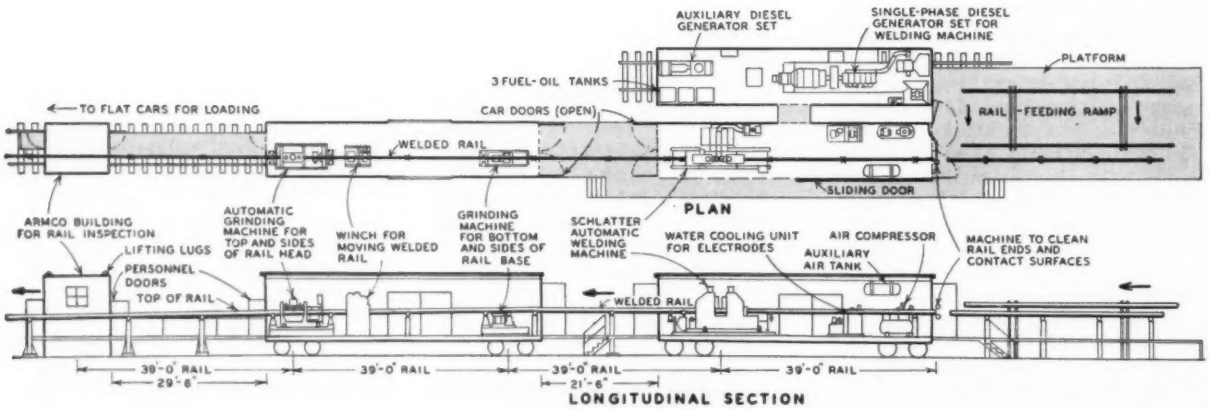
In the preheating phase, the rail ends are heated to approximately 2000 deg F. This is accomplished by making and breaking contact between the ends of the two rails at the weld. The movable platen operates to produce this make-and-break contact by moving the end of the following rail against and away from the end of the forward rail. The quick heating of the rail ends results from the resistance created by the arcing of the current during this make-and-break action.

WELDING-MACHINE OPERATOR is centering rail ends at the joint and alining rails preparatory to clamping them in platens. The rail end at left will be held by a fixed platen while end at right will be clamped in movable platen.

RAIL WELD immediately after completion. Note upset metal at rail ends.

As soon as the proper preheat temperature has been reached, the thermostatically controlled flashing operation starts automatically. In this process a pneumatic "upsetting" press, controlled by a hydraulic braking unit, pushes the movable platen and the rail clamped within it toward the fixed platen and its clamped rail. The flashing process starts when the two rail ends touch. The metal on the faces of the rail ends is volatilized by the resultant arc and a pressure of gas is built up between the surfaces during the arcing. The action of this pressure prevents access of air to the surface of the metal. There is, therefore, no oxidation and the joining metal is kept chemically clean. The pressure of the gas blows all molten metal and any slag or other impurities out of the gap. The rail ends are heated during this stage to welding temperature.

LAYOUT of welding line at Albuquerque. Heavy arrows indicate flow of rail from rail-feeding ramp through various operations to its discharge to cars at end of line, for transportation to laying site.



UPSET METAL being sheared off of base and head of rail in welding machine.

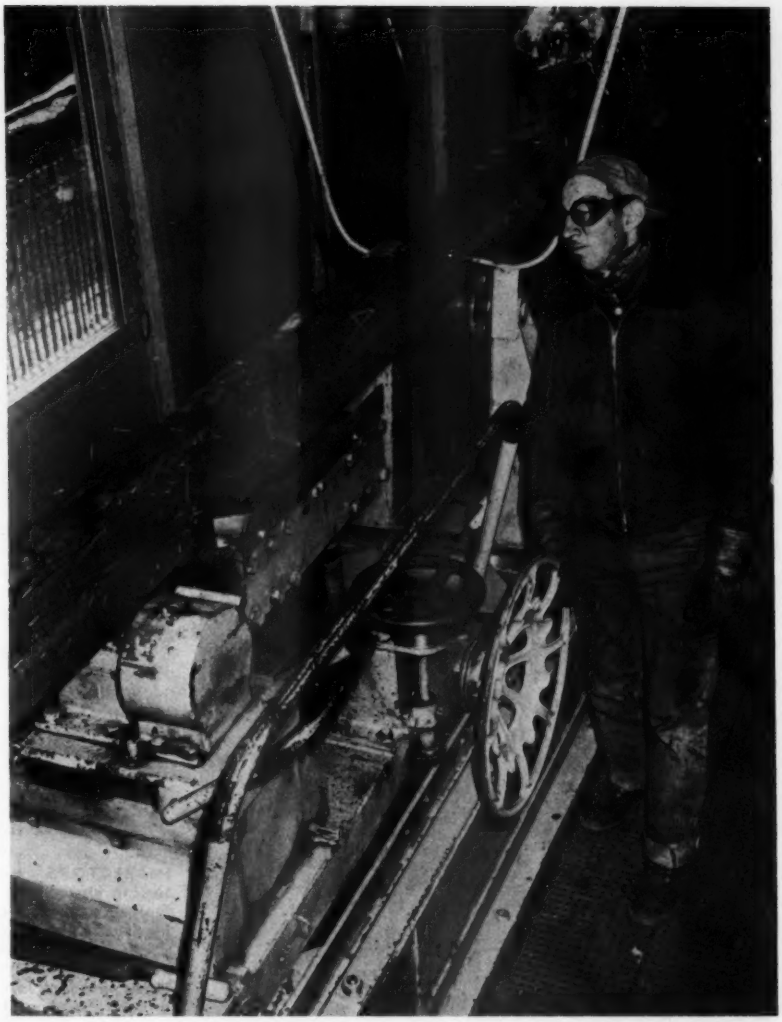
When sufficient material has been flashed off the rail ends and the welding temperature has been attained, the upsetting process begins instantaneously. At this stage the rail ends are subjected to heavy pressure. This is produced when an oil brake, which has been in operation up to this point, is suddenly released allowing the full force of a hydraulic press to push one rail end against the other. This squeezes all molten metal out of the weld into an upset; completing the weld.

At the end of an adjustable interval which begins at the moment of upsetting the welding current is interrupted automatically. This interval is controlled by a timer on the control panel of the welding machine.

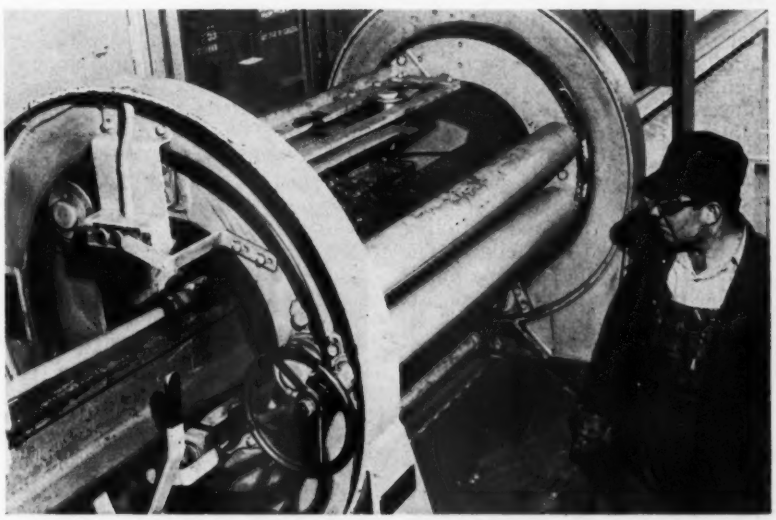
When the welding process is complete, a signal light labeled "Welding Process Ended" lights up on the control panel. The operator then releases the clamps of the movable platen, and removes the electrodes. The next step is to remove the upset burr by a special shear which is clamped in the movable platen when in use. When the platen is actuated the shear moves against the burr on the top and sides of the rail head and the bottom and sides of the rail base, trimming off the upset metal, leaving about 1/32 in of metal for grinding.

How Grinding Is Done

As a weld is completed it is moved to the first grinding station with the aid of a winch located in



BASE-GRINDING MACHINE removes 1/32 in of metal left on bottom and sides of rail base after shearing operation. This machine is manually controlled.



SEMI-AUTOMATIC head grinding machine takes over and removes excess metal left by the shear on top and sides of head using the rail itself as a guide.

GRINDING COMPLETED, the rail goes to the testing station housed in a portable Armco building at the end of the welding line.

INSPECTORS at testing station examine weld in a Magnaflux test to determine its soundness. Note finish grinders left on the head and base of rail.

the grinder car but controlled by the welder operator. The first grinding station is equipped with one of two electrically operated grinding machines of special design. They, and the winch, are powered from an auxiliary General Motors diesel-driven generating set located in the power car. The first grinding machine consists of two units, one designed to grind the base of the rail and the other to grind the two base edges. The machine is operated by one man.

The base-grinding unit consists of a horizontal grinding wheel attached to a motor mounted vertically within spring-loaded guides. Rollers bearing against the bottom of the rail also help to guide the unit. The base-edge grinding unit consists of a horizontal motor driving two vertical grinding wheels. This unit is mounted on a base which permits movement laterally with respect to the rail; the whole machine is so mounted that it may be moved longitudinally to the rail. The machine is manually controlled and is equipped with stops to prevent over-grinding.

Semi-Automatic Head Grinder

On completion of the base-grinding operation, which is done while the next weld is being made, the weld is moved to the head-grinding station. In this machine, also operated by one man, the grinding equipment is supported in a frame mounted on four rollers which operate on a track fastened to the car floor. This arrangement provides for longitudinal movement of the grinding equipment for spotting purposes. Two supports, each in effect a circular track, are mounted on the frame. The grinding unit is so mounted that it extends between and rides on these circular tracks in such a way that it can rotate through an angle of 180 deg while oscillating longitudinally.

To grind the rail head, the operator positions the grinder wheel as desired and switches the machine to automatic. The machine then takes complete control and automatically rotates about the sides and top of the rail head while oscillating longitudinally in a motion guided by two follower rolls.

Welds Are Tested

When the grinding operation is completed the weld is moved to the testing station. Here two men (railroad employees) examine the weld with the aid of a Magnaflux testing machine. If a defective weld should be found, it is immediately cut out with a portable rail saw and the two rail ends are pulled back to the welding machine to permit a new weld to be made.

As the lengths of long rail come from the production line they are loaded directly on a string of 31 flat cars. Each flatcar is equipped with one assembly made up of 12 especially designed roller-bearing rollers on a common shaft in order to support the rails. These cars will hold 12 strings of welded rail, each approximately 1440 ft (37 rails) long. The draft gears of the cars are blocked to prevent slack action in the train. Two trains have been provided so that one may be loaded while the other is transporting the rail to the unloading site.

The welding operation is carried out in two shifts with the expectation that, when full production has been reached, it will approximate 180 welds per day. A force of 11 men is required for each shift, including the foreman. This includes all personnel necessary to handle the rails from the stock piles to final loading on the train for transportation to the point of laying. Two of these men are Matisa employees who operate the welding machine and the power car. The remaining are railway company employees.

Only full-length No. 1 and No. 2 rails of given heats are shipped to the welding line from the steel mills. Other rails from the same heats are shipped to the railway's frog and switch shop at Newton, Kan. All rails sent to the welding line are blanked on both ends, except for a limited number of rails that are drilled at one end only for use as the end rails of the strings.

Opening Day at Des Moines...

1 For an engineer to make sound decisions, he must have a firm grasp of the facts and be aware of certain fundamentals. For construction men, a clear understanding of basic principles will often answer problems they face in their daily work. Here the importance of durability in concrete is being stressed together with the means necessary to secure a durable concrete, that is, an understanding of the water-cement ratio. All materials being equal, the durability, strength, water-tightness, wear resistance and economy are all directly proportional to the amount of water per sack of cement. Increasing the water-cement ratio reduces all of these by thinning the paste.

2 Since 66 to 78 per cent of concrete consists of aggregate (sand and gravel or crushed stone) it is only wise that good or bad material be recognized. Aggregates possess certain characteristics and it is important that a competent concrete man have the ability to recognize them. These include such things as shape, gradation, soundness, hardness and strength. Weak, friable pieces, such as are being broken here, with light taps of a hammer, are undesirable. If found in excessive quantities the aggregate should be disqualified.

Turn page for more pictures →

For Better Concrete . . .

School Days Are Here Again

Plans for the Quality Concrete School which was given at Des Moines, Iowa, on the Rock Island were concluded at a meeting in the office of the chief engineer in the LaSalle Street station, Chicago. Final arrangements are being discussed here by W. B. Throckmorton, chief engineer; J. F. Marsh, bridge engineer (right), and railway representatives of the Portland Cement Association, A. H. Gustaferro (left) and W. G. Burres (standing).

● How's your concrete IQ?

Railroad bridge and building men all over the country are getting the answer—and at the same time are upping their concrete know-how—by means of "refresher" courses sponsored by the Structural and Railways Bureau of the Portland Cement Association. The fundamentals of hardened and plastic concrete, aggregates, mix design, field practices and construction details are all covered during these schools, which are held at places designated by individual roads.

The first of these Quality Concrete Schools, as they are called, was held on the Chesapeake & Ohio in 1951. Since then, a total of 59 courses have been presented to more than 2,000 railroad men on 33 major railroads in the United States and Canada.

On this and the following pages you will follow the progress of a class through a two-day course in a Quality Concrete School held on the Chicago, Rock Island & Pacific at Des Moines, Iowa.

Concrete School . . .

3 Tests are available which will quickly check many of the characteristics of concrete and the materials used in its manufacture. While some tests are not conclusive, when taken by themselves, they do offer indications to the inspector whether additional and perhaps more complete tests are required to prove the quality of the material. Here the instructor demonstrates a simple test for organic impurities in fine aggregates. A simple chemical solution obtainable at any drugstore is added to a specimen of sand. This solution reacts to any organic material in the sand and changes color. If this is darker than a light straw color additional tests should be made.

4 It is highly desirable that each batch of concrete be the same, that is, have the same consistency and workability. Variations in proportions affect these factors considerably. Too much sand will stiffen the mix unduly, too little will make it overly fluid with a tendency toward segregation. Therefore accurate measurement of materials is essential. Here, the instructor demonstrates the bulking of sand. The addition of 5 per cent water to dry sand causes it to bulk up to 40 per cent. This demonstrates why accuracy demands batching materials by weight instead of by volume. The demonstration is usually received with amazement even from experienced concrete men.

7 On completion of the trial mix the class is divided into six working groups. Each of these is assigned a table and a set of the previously described equipment. Measured quantities of sand, coarse aggregate, cement and water are then provided from which additional trial mixes are made. This group is combining (dry) a quantity of sand, coarse aggregate and cement. When these are thoroughly mixed, the water (the amount of which will depend on the selected water-cement ratio) will be added. Class participation in the mixing and testing of trial batches to meet simulated job requirements gives valuable experience that can be carried back to the job.

8 The dry ingredients and the water are then thoroughly combined. The consistency of the mixture is checked by eye. An experienced concrete man is able to judge quite accurately whether the mix is too wet. Additional sand and coarse aggregate are added as required, until the designer feels that the mix is nearing the desired consistency and that the amount of sand used in the mixture will economically provide the type of finish that is desired. This group is completing the mixing of a trial batch of concrete under the watchful eye of C. D. Bullock, regional structural engineer, Portland Cement Association, Kansas City, Mo.

According to Warren G. Burres, railway representative, Structural and Railways Bureau, PCA, these concrete schools result from either a request on the part of the railroad or a meeting between the chief engineer or other officer of the railroad and a representative of the association.

Initially, it was necessary for the PCA to sell the importance of these schools to the railroads. Now, however, it is not unusual for interested railways to take the initiative in requesting that QCS courses be given for the benefit of their employees. In fact the requests for repeat meetings received from some of the railroads may be interpreted as a measure of the success of these schools.

For a school to be successful, it has been found to be important that the chief engineer, or other top supervisory officers, impress his subordinates with the value of the course. In other words, complete backing is important as a foundation for a good school.

When making the decision as to where the course is to be given on a particular road, it is recommended that a point or points be

5 Six sets of mixing equipment, each including a mixing pan, trowel, scraper, two buckets, water can, brush, slump cone, rod and ruler, are shipped to the meeting place of the QCS by the PCA. The railway furnishes tables and the required mixing materials which include 300 lb each of gravel or crushed stone and torpedo sand, together with one sack of Type I portland cement. This material and equipment are used in the design of trial concrete mixes. The design of a concrete mix is based on several factors—the correct water-cement ratio for durability and strength, consistency as measured by slump, and the maximum size of aggregate used.

6 Once the requirements have been selected a trial mix is made. Here a demonstration of such a mix has just been completed by W. G. Burres, Structural Railways Bureau, PCA, acting as the instructor. The mix involves nothing more than one-tenth sack of cement, a predetermined amount of water (based on water-cement ratio) and arbitrary quantities of fine and coarse aggregates which will result in a mixture having the desired consistency and finishability. Materials used in the trial mix are accurately weighed to permit calculation of the quantities which will be required to produce a cubic yard of concrete under field conditions.

9 Consistency of the mix is measured physically in the next step with the help of a slump cone. In this country, consistency is usually specified as so many inches of slump. The slump is obtained by filling the 12-in high standard slump cone in three equal stages. Each layer is rodded 25 times with a $\frac{5}{8}$-in steel rod before the next layer is added. The concrete is then smoothed off, at the top of the cone, with a trowel and the cone is lifted off of the concrete. As might be expected the concrete will subside as the support of the cone is removed. It is also evident that the stiffer the mix is made the less will be the slump of the concrete.

10 The amount of the slump is measured from the top of the slump cone. This is done by placing the cone alongside of the concrete and measuring the amount of subsidence between the top of the cone and the mean surface of the concrete. A slump measurement within $\frac{1}{2}$ in either way from that desired is as accurate as can be obtained. If the team does not obtain the proper slump with the trial mix, adjustments are made. This is done by the addition of fine or coarse aggregate, until the proper slump or consistency is obtained.

Turn page for more pictures →

selected that will be centrally located for those who will be attending.

A room, of sufficient size to comfortably accommodate the class, should be provided. This room should be equipped with seats, light, heat and electrical outlets. Blackout curtains at all windows are necessary to darken most rooms successfully during movie and slide demonstrations. Toilet facilities should be available. In addition, a blackboard should be provided as this is an essential during the lecture sessions. A number of work tables are also required for use of the class during the laboratory periods. All of these items are furnished by the railroad.

Movie and slide projectors, together with the necessary mixing, proportioning and testing equipment used in the design of the trial mixes, are supplied by the PCA. In addition, the association also furnishes literature on the design, control and uses of concrete, and the necessary data sheets for recording information on the design of the trial mixes together with the final examination papers.

The practice is for the schools to

Concrete School . . .

11 Once the proper slump has been obtained, the next step is to determine the quantity of the materials used in the trial mix. This is determined by weight. Since all of the water and cement were used, the original weights of these materials are recorded. The sand and coarse aggregate remaining in the buckets must be reweighed, since all of these materials were not usd in the trial batch. The difference between the original and final weight is then recorded. Care must be exercised in determining these weights since errors are often magnified 50 or 60 times when the design is translated into quantities per cubic yard for use on the job.

12 After the mix has been proportioned, so that the designer is satisfied that it looks and feels right, all that remains to be done is the calculation of the yield and quantities required per cubic yard of concrete. These calculations are not difficult since they require only the use of addition, multiplication and division in the application of a few simple rules. A simple form is used to tabulate data and aid calculations. Marts Blue, field engineer, Portland Cement Association, is here helping one team check their final results with the aid of his slide rule. An ability to use a slide rule is helpful in easing the calculation load, but is by no means necessary.

15 Every possible means is used to supplement the lecture type of instruction. As many demonstrations as possible are used. Slides, sketches and models are used to the maximum. In addition, three 16-mm sound movies in color give further warmth and variety to the instruction. The films—titled "The Drama of Portland Cement"; "How to Make Quality Concrete"; and "How to Transport, Place, Finish and Cure Quality Concrete"—cover the manufacture of portland cement, the functions of the Portland Cement Association, the fundamentals of concrete, etc. They are shown following the instruction and provide an excellent review of the material presented.

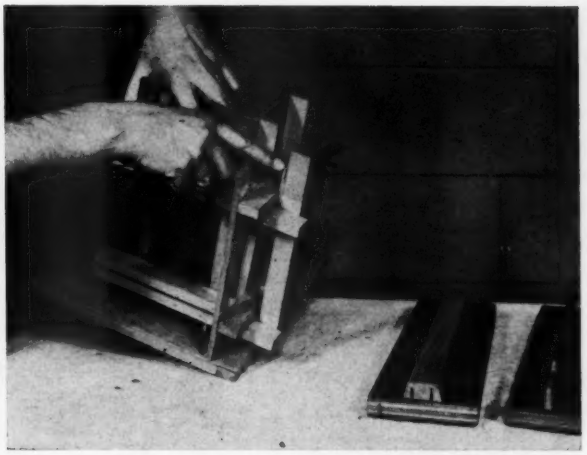
16 P. D. Miesenhelder, research engineer concrete, Engineering Division, AAR, attends all the schools to the extent time permits. His experience and understanding of concrete problems, particularly as they point toward railroad uses of concrete, are brought into play in the solution of difficult problems brought up in the question-and-answer sessions. In filling the "clean-up spot," "Pete" summarizes the meetings and discusses railroad concrete problems. He brings out the role of the Association of American Railroads in concrete research. Mr. Miesenhelder rounds out the school's faculty of concrete men with wide and varied experience.

be attended by all supervisory personnel who have anything to do with the making of concrete. According to Mr. Burres, the PCA recommends that the "students" should include a representative from the chief engineer's office (the chief himself if at all possible), the bridge engineer, the building engineer and designers from the bridge and building departments, construction engineers and men from the division engineers' offices—in other words those men who provide design and inspection service for the railroad.

It is equally important, according to PCA representatives, that the schools be attended by bridge & building supervisors, master carpenters, bridge foremen, concrete foremen and even men from the concrete crews. Also, they point out that it is important not to overlook the fact that much concrete is made by the signal forces, and that, consequently, representatives of that department should be included.

The standard QCS course runs two full days. The fundamentals of hardened and plastic concrete—that is, the factors that make the ma-

13 The effect of various water-cement ratios is being demonstrated here. The six teams were each assigned specific mixes. Three teams used the same water-cement ratio and had the same quality of concrete with varying slumps. The three remaining teams were assigned the same slump but variable water-cement ratios, and had concrete of equal consistency. Final results, in terms of quantities of materials per cubic yard, were tabulated on a blackboard and compared. This demonstrated the economy of using stiffer mixes; that the total water content remained constant for mixes of equal slump; and that sand content was important in finishability and economy.



14 Proper erection of forms plays an important part in successful concrete construction. This model form was used to point out important details such as the proper installation of wales and wedges which are necessary to tighten forms satisfactorily, prevent leakage and provide adequate stability. During discussion of construction details ample coverage is given to such important items as construction joints, repairs to existing concrete and cleaning. The importance of proper field practice, particularly as it applies to storage of materials, batching, mixing, transporting, placing and finishing, are emphasized in lectures with ample opportunity for questions and answers.

17 As in any course of instruction, last but by no means least, comes the examination. For the short course in quality concrete this detail is covered in a three-page set of questions covering the details of the two-day meeting. It is used chiefly as a comprehensive review of the subjects and material presented. The only grading is done by the men themselves. Wherever possible questions have been phrased in such a manner that they require only a "yes" or "no" answer. Finally, this period provides an opportunity to correct and clarify any obvious misconceptions which may have developed. As can be seen from the picture, this does not seem to be too solemn an occasion.

18 Like any school there must be a graduation picture. Here we see the group that completed the Rock Island school at Des Moines. The picture was taken on the east side of the stores building in the Rock Island yard at Des Moines. It includes in the front row, among others, J. F. Marsh, engineer of bridges, E. A. Matney, assistant to engineer of bridges, J. R. Williams, assistant bridge engineer, S. T. Robertson, W. P. Hale and H. B. Christianson, Jr., division engineers. Instructors in the back row of the picture include Mr. Burres, Mr. Bullock and Mr. Blue of the Portland Cement Association, and Mr. Miesenhelder of the Association of American Railroads.

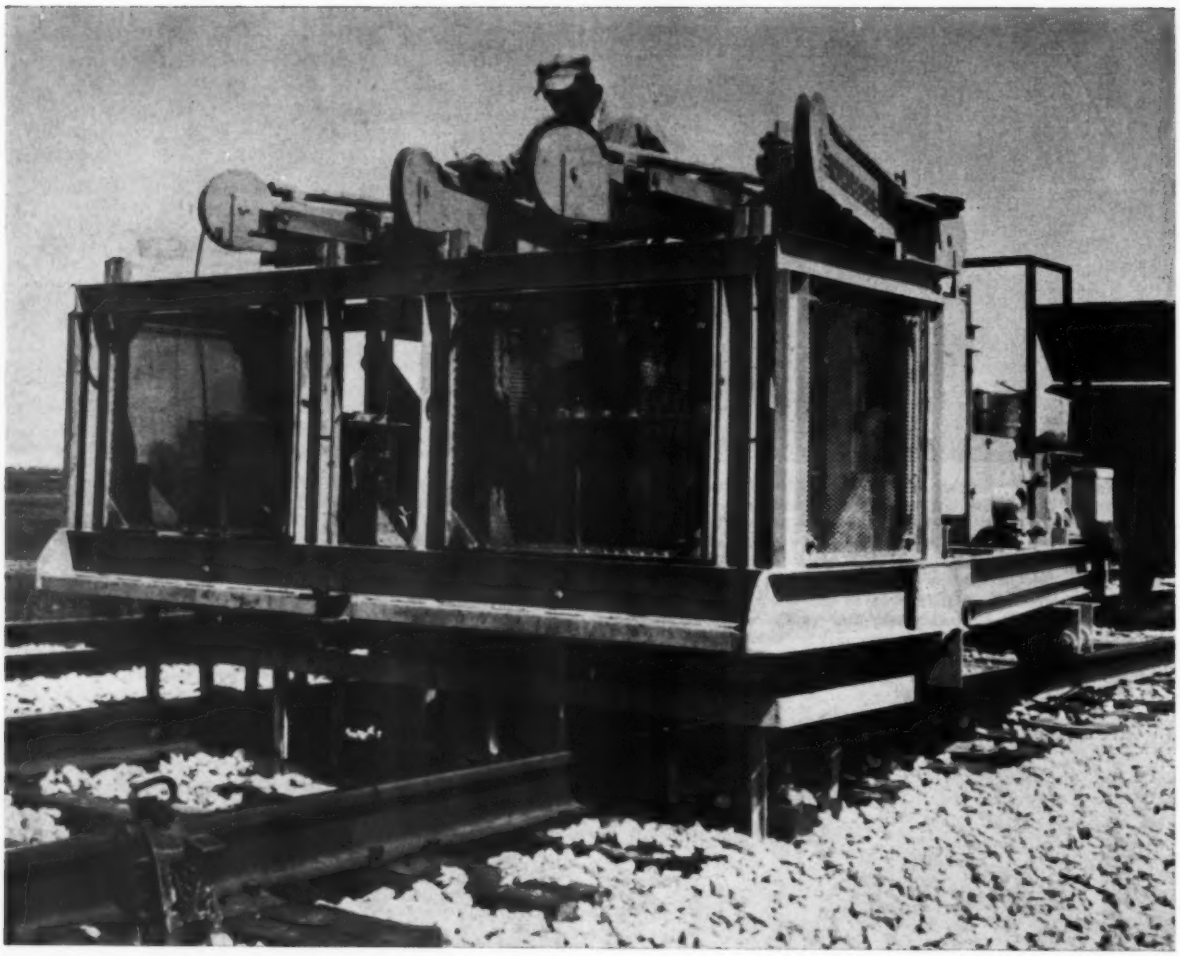
terial act as it does—are covered the first day. The materials used in making concrete are discussed and the design of a concrete mix is explained. The class is then divided into six sub-groups so that some practical work can be done on the first afternoon.

This latter work is one of the more important phases of the QCS. It includes the preparation of actual trial batches of concrete which are made from materials furnished to the school by the railroad company.

The second day of the school is concerned with problems of inspection and control, field practices, construction methods and techniques.

Instruction is provided by members of the PCA district offices and engineers from the Structural and Railways Bureau of the PCA. Vocal instruction is supplemented with the use of slides, drawings, demonstrations, tests and motion pictures.

The objective is to present the subject material simply and thoroughly. Questions are encouraged and problems peculiar to individual railroads are given special attention.



SPLIT HEADS, each with eight tamping tools, can be operated together or independently, permitting tamper to be used for either out-of-face or spot-surfacing work. Automatic cycling mechanism controls insertion of tools and indexing.

New Production Tamper Has . . .

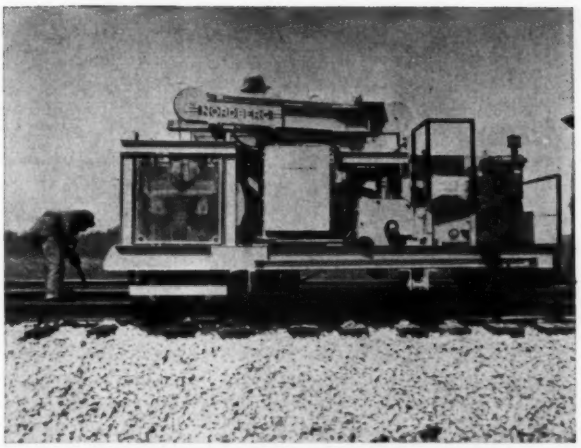
• Unusual vibrating principle
• Automatic operating cycles
• Wide range of adjustments

● The latest addition to the family of on-track production tampers available to the railroads is the new Nordberg Automatic Gang Tamper, developed by the Nordberg Manufacturing Company, Milwaukee, Wis. The first production model of the machine came off the assembly line recently and went into service for demonstration purposes on the Erie in mid-April.

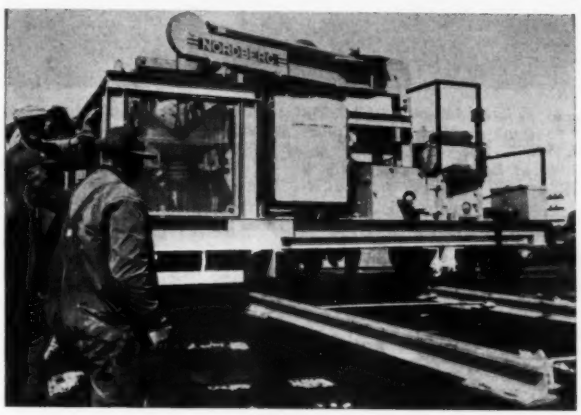
A pilot model of the machine had been developed some time ago and had seen service on several roads for testing purposes. Following the trial runs of the pilot unit the tamper design was modified somewhat to incorporate desirable features brought out during the tests.

Employing an entirely different principle of vibration and a completely automatic tamping cycle, the machine is equipped with split tamping heads so that it can be used for either out-of-face or spot surfacing. The unit, weighing 16,000 lb and powered by a 32-hp, air-cooled gasoline engine, is 14 ft long, 9 ft 6 in wide and extends 6 ft 9 in above the rail. Power from the four-cylinder engine is transmitted through a fluid coupling to all parts of the machine. A four-speed transmission permits travelling speeds of up to 25 mph in either direction, and a separate gearing in a "super low" range is provided for indexing while tamping.

The tamping heads, which can be operated either independently or together, are powered by a V-belt drive from the fluid coupling on the engine. The tamping head assemblies each incorporate a vibrator unit with an eccentrically-weighed shaft. The assembly is identical to that which is used for powering the Rod Deck screens on Nordberg's Screenex machine. The vibrating mechanism is adjustable to give from "light" to "very heavy" vibration. The eccentricity of the weight can be varied from a minimum of $\frac{1}{8}$ in to a maximum of about $\frac{3}{4}$ in. With the $\frac{1}{8}$-in setting the effect



POWER PLANT (at right) is a 32-hp, air-cooled gasoline engine. A fluid coupling links engine with various drives.



SET-OFF wheels are equipped with hydraulic rams to raise machine so that it can be rolled off on transverse rails.

is to transmit a ⅛-in blow to the tamping bars; with the ¾-in setting the effect is equivalent to a ¾-in blow.

The eccentric weight is attached to the shaft in the form of a horseshoe collar. A spring holds the weight in place against the shaft when it is not rotating or is rotating only slowly. As the speed of the shaft builds up, the weight is thrown outward by centrifugal force until it reaches the desired eccentricity as determined by the spring adjustment. The vibrator shafts are supported by roller bearings, and the entire vibrator drives and tamper bars are mounted on a heavy alloy-steel casting.

The tamping heads are held in alinement by heavy leaf springs, one at each corner of each head. Raising of the heads is performed by hydraulic rams, one for each head. The rams are single-acting in that they are used only for raising the head, the fall being by gravity. Each of the rams is powered by a separate hydraulic pump.

Automatic cycling of the tamping operation is controlled by a 12-volt electrical system employing four banks of relays. The first bank controls the first insertion of the tamper head into the ballast and also the time of vibration in the ballast before the head is lifted. The second and third banks control the second and third insertions into the ballast and the time of vibration before each lift of the head. The fourth bank controls the final lift of the head, then energizes an electromagnetic clutch to start the machine moving to the next tie. The second and third control banks may be by-passed, if desired, so that one, two or three insertions may be selected.

The amount of fall of the tamping heads and the impact with which they strike the ballast can be adjusted. Another adjustment permits varying the vibrating time in the ballast from 0 to 10 sec. The intensity of vibration can also be varied by changing the eccentric weight, as already mentioned. A fourth adjustment varies the angle of the tamping bars to the tie.

Three different types of tamping bars are available for use on the unit. The first is a wide, bar (6-in face) for use in making high lifts in any kind of ballast or for making moderate raises in small-size ballast. The second bar has a 3-in face and is recommended for use in making lifts of up to 3 in. The third is a spot-surfacing bar, also with a 3-in face, but with a point 1½ in long on the end for penetrating purposes. The point is about 1 in wide where it joins the base of the bar.

The latter two types of bars are available in left-hand or right-hand. With either of the 3-in sizes the position of the bars with reference to the rail can be varied as much as 2¾ in in increments of ½ in. This variation is accomplished by the use of either the right- or left-hand bars and by changing the combination of washers used where the bars attach to the vibrator assemblies. The bars are ½-in thick on the tamping end and are made of alloy steel coated with "tube borium" on the wearing surfaces.

In operation, the machine is controlled almost entirely by push buttons. The operator presses one button which starts the automatic tamping cycle on a particular tie and, when the cycle is completed, starts the machine moving ahead to the next tie. The operator pushes a second button to spot the machine over the next tie, and again pushes the first button to start the tamping cycle all over again. When necessary, the machine can also be operated by manual push-button, eliminating the automatic cycle.

The manufacturer claims that the tamping speed of the machine is dependent upon three principal factors; namely, the kind of lift being made, the type of ballast and, most important of all, the quality of tamping which the railroad desires.

On the Erie, the production unit was being used on the road's double-track main line near Kouts, Ind., for tamping a finish raise of about 1½ in limestone ballast. Tie renewals had been made in advance and were, therefore, not involved in this particular operation. Prior to the surfacing work, ballast was unloaded lightly along the track to be raised. At the time a reporter visited the work location, production of the tamper was running from about 10 to 13 rail lengths per hour.

The tamper can be removed from the track onto a previously prepared tie or crib set-off. Four transverse wheels are hinged to special mountings on the underframe of the machine. The wheels are raised and lowered in their mountings by a hydraulic hand pump. When setting the machine off, the wheels are lowered onto the set-off rails, then are used to jack the machine up so that the running wheels will clear the track rails. The unit can then be pushed into the clear. The transverse wheels are mounted so that the set off rails are at standard gage.

In addition to the tamper, a Nordberg Trakliner was also being demonstrated on this job. The self-propelled, on-track lining machine was being used to line track behind the surfacing operation.

M/W Clubs Elect New Officers...

Complete election results are given in Association News columns beginning on page 66.

Twin Cities: J. M. Gustafson, bridge engineer, Minneapolis & St. Louis, is the new president of Northwest M/W Club, elected during meeting at Midway Civic Club, April 28.

St. Louis: E. L. Anderson (left), chief engineer, Frisco, and new president of Mississippi Valley M/W Club, receives gavel from retiring president, W. J. Hedley, assistant chief engineer, Wabash, during installation ceremonies at De Soto Hotel, May 9.

News Briefs in Pictures . . .

Chicago: N. D. Howard (right), secretary, AREA, being installed as president of the Chicago Maintenance of Way Club by E. C. Vandenburgh, chief engineer (ret.), Chicago & North Western, on May 2 at Hamilton Hotel.

R. H. Beeder, assistant chief engineer, Santa Fe, becomes new 1st vice-president at Chicago. V. R. Walling, chief engineer (ret.), Chicago & Western Indiana, and a past president of club, is at right.

WHAT'S THE ANSWER?...

. . . a forum on track, bridge, building and water service problems

Thickness of Stringer Shims

Open-deck timber trestles with butt-jointed chords are sometimes surfaced by placing timber shims or a slip or false cap of proper thickness between the caps and the stringers. What is the maximum permissible thickness of shim that may be used before a slip or false cap is required? Explain.

Favors "Slip-Caps"

By L. P. Drew
Assistant Chief Engineer, Union Pacific, Omaha, Neb.

It is seldom desirable to use shims of greater thickness than ¼ in. Since plywoods manufactured from the better grades of lumber and fabricated with waterproof glues are now available, "slip-caps," ¼ in to 1 in thick, can be made from this material and serve for minimum raises.

If excessive shimming is required to surface a bridge it is often more desirable to make a track raise of one or more inches so that slip-caps of 3-in or 4-in material can be inserted. These slip caps should be adzed or surfaced to various thicknesses, as required for each bent, so that an almost perfect surface can be obtained without the use of any additional shims. There is a decided advantage in the use of slip-caps of the same width and length as the regular cap. These can be spiked or bolted to the main cap which avoids the possibility of their working out.

A Matter of Judgment

By C. O. Sathre
Supervisor Bridges & Buildings, Chicago & North Western, Madison, Wis.

There are many things which must be considered when it is necessary to surface an open-deck timber trestle. These include the type of trestle, its age, condition, height, the type of traffic which it carries, traffic density, speed of trains, and the economy of maintaining the bridge on shims of various sizes.

Shims always require more frequent inspection and maintenance on account of splitting and wear and because they work loose under vibration. They are also susceptible to decay. This condition applies not only to the shims but also to the timbers in contact with them. It is a result of the additional spaces where moisture can enter when it is necessary to maintain shims in place over a period of time.

When a job of surfacing requires the use of shims and false caps, the good judgment of the foreman comes to the fore. I believe that, in the selection of the thickness of shims and the type of fastening to be used—nails, boat spikes, drift bolts and bolts—that experience is the best teacher. The cooperation of the supervisor is essential on any special job or where any amount of extra cost is involved. This cooperation will result from close contact with the work and education of the men in the field.

I believe that bridges on a main line which carries any amount of fast or heavy traffic should not be maintained with over 3 in of separate shims under each chord. Where it is necessary to shim over 3 in, false caps, not less than 10 ft long, which cover the entire width of the cap, should be used.

If a bridge is located where track cannot be raised to accommodate a false cap of 4 in or more and the bridge is of such a height that stability is of concern, the tops of the piling should be inspected thoroughly. If these are found to be soft or to contain heart rot, the tops of the piles should be cut down to accommodate the thickness of the false cap desired. In such cases it may be desirable to cut deep enough to permit the installation of double caps with or without separator shims or blocks.

Bridges on secondary branch lines can be carried on shims up

Answers to the following questions are solicited from readers. They should be addressed to the What's the Answer editor, Railway Track and Structures, 79 W. Monroe St., Chicago 3, and reach him at least five (5) weeks in advance of the publication date (the first of the month) of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you may wish to have discussed.

To Be Answered In the September Issue

1. What factors determine the minimum adequate depth of ballast under track? Does this vary with different types of ballast material? How? Why? Explain.

2. What causes hair cracks to form on the surface of concrete? Are these cracks detrimental? How can they be avoided? Explain.

3. In many present-day reorganizations of track-maintenance forces, section gangs as such have been reduced to skeleton organizations. Under these conditions, is it practical to program routine section work? If not, why? If so, what are the advantages? Explain.

4. What, if any, effective method exists for the encasing of steel H-piles with concrete before they are driven? Explain.

5. Is the use of salt to prevent or reduce the winter heaving of track practical? If so, when should it be applied? How? What, if any, restrictions should be observed in its use? Explain.

6. When the screen of a deep well becomes clogged or choked with sand, what measures may be employed to clean the screen and restore the flow of water? Explain.

to 4 in thick if the shims show good grain and are securely fastened. Over this false caps should be used. These may be installed with or without separator shims as the use of treated material has eliminated the necessity of air circulation around the timbers to delay decay of the wood.

Grouting Mix for Roadbed Stabilization

What is considered to be the most effective grouting mix for roadbed stabilization? Should the proportion of materials vary under different soil conditions? To what extent? Why? Explain.

Varies With Roadbed Condition

By Rockwell Smith
Research Engineer Roadway, AAR, Chicago

Usual mixtures for the slurry used in roadbed pressure-grouting operations vary according to the equipment and process used. Where the pneumatic process is employed the mix will usually be richer in cement than 1:7 parts of sand. There are exceptions to the above but the limits apply to general practice encountered on the railroads. The proportions also vary within these limits according to the policy of the various roads. Water requirements run between 4 and 5 gal per cu ft of dry material and asphalt is quite often used in quantities approximating 1 pt per cu ft of dry ingredients.

For grouting with the piston-displacement or hydraulic method, mixtures generally average less cement than is used for pneumatic work. Such lean combinations as 1:32 have been used. Asphalt is also quite generally used in the hydraulic method as it is of considerable value in reducing line blocks and machine maintenance.

The gradation of the sand will often determine the mixture which best can be used. In all cases 100 per cent of the sand should pass a No. 20 mesh sieve and if possible over 80 per cent should pass a No. 40 sieve. Rather silty sands, approximately 20 per cent of which pass a No. 200 sieve, work well and show no detrimental results because of the fines. To reduce cement content and still obtain flowable mixtures, fly ash, a product of steam plants burning pulverized coal, has been used successfully. This material is mainly composed of silicas, it is usually non-plastic, and has a grain size finer than that of standard portland cement. Other admixtures, such as pulverized limestone, can also be used. The addition of these materials reduces the frictional resistance to flow of sand slurries, and in effect will reduce the cement requirements for the same flowability.

In addition to the above considerations the purpose and the type of grouting on the project will determine the proportions. Some roads, which have a considerable depth of coarse open-graded ballast, where the grouting is intended to penetrate the lower portion of this material and produce a slab of some rigidity, use mixtures of 1 part cement and 6 parts or less of sand. One road in the past has used 1:1 mixtures and 1:2 mixtures almost exclusively for this type of work. This is principally done on deep pockets. Leaner cement mixes may be used for the more shallow pockets. This avoids setting the ties and producing too much cementing strength in the upper portion of the ballast. The above two conditions usually apply in areas where grout acceptance is relatively low. For other conditions, such as tunnel floors or rock and shale cuts, where acceptance is low and often difficult to obtain, neat cement-water mixtures are required.

On fill work, particularly with hydraulic operations, the mixtures are usually 1:8 or leaner. Acceptance is often high on such projects and, according to present observations, the decreased cement content, has had no apparent effect on the results obtaind. Also, where acceptance is high the grout slurry can be thickened. Too great reduction in the water and cement, however, may result in line plugs and delays. In such circumstances labor cost may nullify any other savings.

It is to be noted that labor usually constitutes about three quarters of the grouting costs. Further, reduction of cement contents in say a 1:9 mixture produces very small savings, depending somewhat on the cost of the sand. Therefore, while it appears that only small cement contents are required for successful results some additional expenditures for cement are advisable. This is because of the insurance, at low additional cost, that the hardening of the richer grout material will render since it is more permanent, especially in places where it is subject to percolating waters.

Thus, it is apparent that the mix proportions should vary with the conditions and type of roadbed instability to be corrected. In addition, the type of equipment and the characteristics of the ingredients will also influence the composition of the most advantageous slurry. In cases of typical roadbed instability the soils involved are almost invariably of medium to high plasticity and in themselves require no changes in the grouting mix.

Consider Cost of Placement

By J. B. Farris
Assistant Engineer, Southern, Cincinnati, Ohio

The design of a grout mix is based primarily on the economics of placement. Since the labor cost usually represents the greatest expense in this work, the labor involved in handling the materials and placing the mix must be held to a minimum. The quantity of cement and other additives, if used, must be so proportioned as to keep the sand suspended in the mix until it is injected into the soil. Ultimately, the size, shape and gradation of the sand determines the proportion of cement and additives used in the mix, and the ease with which the resulting mix may be placed. The proportioning of materials is best determined by field trial to obtain a mix which allows satisfactory placement with minimum material cost.

Conditions may arise that require an increase in the cement content of the grout mix to speed the time of setting, or they may require the use of a cement-water slurry to penetrate soils susceptible to intrusion. Such soils are infrequently encountered along our lines.

A study of unstable track locations on the Western Lines of the Southern has shown that the occurrence of single, isolated unstable locations are unusual. More frequently, these unstable locations occur in groups, with similar groups sometimes existing several miles apart. Where such individual

groups have been studied, the following conditions are often present: (1) Similar construction practices; (2) similar geological structures; and (3) similar soil-mapping units.

To date, there appears to be no basis for arbitrary changes in the mix when treating different soil types. However, the increase in cement content to produce a quicker setting grout for the treatment of unusually rapid-moving slides, and for use in freezing weather, appears valid. The rate of deterioration of the roadbed at the time of treatment is used as the criterion for any adjustment of the cement content in treating sliding fills.

Sand Selection Important

By J. R. Rushmer
Roadway Engineer, Atchison, Topeka & Santa Fe, Amarillo, Tex.

Mixtures containing by volume 1 part portland cement, 1 part fly ash, 16 parts sand, plus 1/10 to 1/6 gal emulsified asphalt per cubic foot of dry material are generally satisfactory for most conditions. The amount of water used is variable and is adjusted to fit conditions at the moment. Where voids are large and grout acceptance is high the mix can be relatively stiff. When voids are small or shallow and acceptance is low, water must be increased and pumping sometimes slowed down. (Cements other than portland can be used if necessary.)

This mixture is generally satisfactory, but less cement and fly ash may be used where voids are large, pressures low and acceptance high. Under only the most adverse conditions should more cement be used (where voids are small and shallow, or pressures required are high) and in such cases water must usually be increased. Rich mixtures are more likely to break up in service and sometimes work their way out of the roadbed, especially in very shallow grouting. They foul ballast worse than lean mixes and make the spotting of track difficult.

Selection of the sand used in grouting is extremely important. "Blow" (dune), river or beach sands are much more readily available in proper gradation than is generally known. Such sands graded so that 100 per cent will pass a No. 14 sieve, 60 to 90 per cent will pass a No. 48, and 20 to 30 per cent will pass a No. 100, are generally very economical and satisfactory. However, care must be taken in loading to avoid lumps of clay, dirt, rocks, trash and weeds. It is not economical to screen sand for grouting purposes. The sands described are usually close to 100 per cent sound material, and make good flowing grouts which consequently fill voids well at reasonable pressures.

Basic Mix Material Governs

By M. R. Brooks
Assistant to Engineer of Track, Chicago, Burlington & Quincy, Chicago

It has been our experience that one cannot formulate a grouting mix until he is familiar with the actions of his base material. Most generally when one refers to a grout mix, they are referring to a slurry mixture of sand and cement with possibly a small amount of emulsified asphalt added. We are aware that some roads use base materials other than sand; however, we are not familiar with those operations.

We are fortunate in having a large supply of blow sand. This is a very fine grained material containing a small percentage of clay. Abrasiveness is not a problem in its use.

We have found that in the use of pneumatic equipment a mix consisting of four parts sand to one part cement is very satisfactory for the majority of treatments. These treatments are usually confined, however, to low fill areas where the normal acceptance averages roughly 5 cu ft per track-foot.

We have, on occasion, increased the cement proportions with a resulting 2.75 to 1 mix. This was used in areas where our acceptance fell below 2 cu ft per track-foot. The basic purpose is to realize the added strength of the grout mix, the increased flowability, and the increased drying action of the subgrade through the use of added cement.

In hydraulic operations, a mix consisting of seven parts sand to one part cement, with 1/3 gal of emulsified asphalt added, has proved very satisfactory. Emulsified asphalt is merely added for lubrication of the grout cylinder rings and not as a carrying agent.

We have deviated from this mix in areas where a slip or slide was present, chiefly to obtain added strength and to increase drying of the fill. Of course, in areas such as these you must, on occasion, change your pattern of grouting.

We have not found that soil variations have any bearing on the results obtained from the use of these mixes.

I might add that on the basis of our experience with grouting treatments, the mere entrance of sand or a lean mixture of sand and emulsified asphalt into the roadbed does not give satisfactory or long life results.

Since the proportional cost of cement is so low, we do not consider it a governing factor in our grouting operations.

Safety Rules for Small Power Tools

What safety rules should govern the use of small electric or air tools? Who should be held responsible for the enforcement of these rules? Explain.

Six Primary Rules

By A. V. Rohweder
Superintendent of Safety & Welfare, Duluth, Missable & Iron Range, Duluth, Minn.

The lightweight power tool, driven by either air or electricity, is a deceptive tool. Its improper, careless use will lead to accidents. Drills, grinders, hammers, saws, and other devices depend upon high speed to gain their particular operating characteristics. It takes only a fraction of a second for something to happen with these tools.

The primary safety rules which govern the use of small power tools are: (1) Know your tool; (2) proper guarding; (3) ground all electrical tools; (4) grip tool securely; (5) use goggles; and (6) use tool properly for its intended purpose.

Application of the first safety rule, "know your tool," implies that either the employee has read the instructions thoroughly and become familiar with the use of the tools through this means, or that the foreman has given him proper instruction in the use of the power tool. These instructions must be complete. The hazards involved in the improper use of the tool should be pointed out. However, emphasis

should be on the positive side; that is on the proper and safe use of the tool.

Before a tool is purchased it should be determined that adequate guards are provided, thus conforming to the second item, "proper guarding." These guards should be installed and operated to minimize the hazard. It might be said that the switches and air valves should be so positioned on the tool, that it will not start accidentally when picked up.

The third point, "ground all electrical tools," is of particular significance in the proper and safe use of electrical equipment. A third wire and the proper receptacle is a must for all hand-held electrical equipment.

Point No. 4, "grip tool securely," means that a firm grip should be taken on the tool before starting. It also follows that, in working with tools when in a standing position, a firm footing is required. In the use of drills and reamers it is particularly important to watch carefully and apply a uniform pressure. It has been observed, during drilling or reaming operations that the drill or reamer occasionally catches. If the operator is unobservant or careless, he could be thrown off balance.

"Use goggles," (Item No. 5) is a necessary rule in power-tool work. It is a "must" in the operation of grinders, for the air-exhaust outlet on air-operated devices could blow dust into the operator's eyes.

Rule No. 6, "use tool properly for its intended purpose," is not the last rule by any means. There are others. For instance, no power tool should be used for any function other than that for which it is intended.

Tools are designed for specific purposes only and there is a definite hazard created by compromising their use.

The responsibility for conforming to the rules rests entirely upon the foreman on the job. It is he who must see that the men are properly instructed, wear goggles and use the tool as required. The foreman should not be alone, however, in the enforcement of the rules. He must have the whole-hearted backing of management.

Tanks for Diesel Fuel Storage

When designing facilities for the storage of diesel fuel, what factors determine the choice between the installation of a single large storage tank or several smaller tanks? Explain.

Based on Four Considerations

By M. A. Hanson

Engineer of Research, Gulf, Mobile & Ohio, Bloomington, Ill.

The total storage capacity should be adequate to provide a reasonable reserve in event of an interruption in delivery of fuel. For stations of lesser importance a 30-day supply is recommended. For the most important stations a 60-day supply should be provided. Thus, the total storage capacity required is primarily dependent upon the volume of fuel consumed.

The size of prefabricated tanks is limited, on account of shipping regulations, to tanks 10 to 12 ft in diameter and 50 ft long. Field-erected storage tanks have been installed that range in size from 100,000 gal up to 2,500,000 gal capacity.

In general, the larger the tank the lower the cost per gallon of storage capacity. Thus, initial costs usually favor the installation of single large storage tanks.

In the sizes in which they are available, prefabricated tanks are usually cheaper than field-erected tanks. For stations requiring less than 100,000-gal storage capacity, multiple prefabricated tanks may be cheaper than a single field-erected tank.

Where the available ground space is limited, the use of a single large storage tank is indicated since the ground space per gallon of capacity is reduced as the size of the tank is increased.

There are several operating advantages in using multiple storage tanks. It may be desirable, at times, to segregate fuels from various suppliers. This can be done only if multiple tanks are available. Multiple tanks greatly facilitate "outage" for such repairs as might be necessary. In instances of accidental contamination of the contents, multiple fuel-storage tanks limit the contamination to a portion of the supply.

The decision to build a single large storage tank or several smaller tanks is dependent upon the total storage requirements, available space, relative cost and the value to the railroad of the operating flexibility of multiple tank installations.

Qualifying Foreman

About how long must a trackman of average intelligence work before he is able to qualify as an assistant foreman? A foreman? Why? Explain.

No Substitute for Experience

By L. C. Blanchard

Roadmaster, Chicago, Milwaukee, St. Paul & Pacific, Minneapolis, Minn.

A quick answer to this question would be: "The best assistant foremen are developed from men having two or more years of basic training as laborers, and the best foremen from those having five or more years of training as laborers and assistant foremen." There is no substitute for experience, and in a period of two to five years most of the normal problems are encountered and a basic knowledge is developed from which other problems may be solved as they arise.

On the other hand a man can be held in a laboring position too long for his own good. The best way to learn to be a foreman is to be one. Any man will develop faster under the load of responsibility, assuming he has the necessary background. Under the press of necessity we have promoted some ninety day wonders, but it takes a rather exceptional man to swing it.

Whenever I have been transferred to a new territory my first thought has been—Who do we have that can be promoted when the necessity arises? Often, I have been told that we had no one that would be suitable foreman material. On

first appearance this might sometimes be the case, but I have never been one to accept that situation as final. Many times a little sounding out will uncover latent ambition or ability. Sometimes ambition can be stimulated. It is the supervisor's job to find and uncover the raw material.

I am constantly amazed at what responsibility and authority will do for a man. Occasionally it will go to a man's head and spoil him, but by far the greater majority settle down and do a surprisingly good job.

A certain degree of intelligence is important to a successful foreman, but intelligence alone is not enough. A man must have the ability to lead other men in their work. He must have a feeling of responsibility both to his company and to the men who work under his direction. Competence in a foreman is at a greater premium when the available supply seems at its lowest. In combing your forces for foreman material watch for the natural or instinctive leader. There is one in almost any group of men. This is the fellow that takes charge when the regular foreman is absent or instantly takes hold of an emergency situation. He may not always be the smartest man in the group, but he gets along and the other men follow him and trust his judgment.

The day of the "boss" telling his men to "do what I tell you or else," is about over. Rather, it is a case of "come, let's do this." On the laborer's part it is the difference between being glad to do something that will please the foreman, or being forced to do something distasteful for which he will receive neither thanks nor credit.

The man who can get along with his fellow men will have a far better chance of making good as a foreman or supervisor. Authority is a fine thing, but the man of competence won't need to exercise it, because he will lead with a "come on fellows, let's go!"

Train With Extra-Gang Foreman

By E. S. Shandrew
Foreman Extra Gang, Southern Pacific, Oakland, Cal.

It is my opinion that a track-man of average intelligence can qualify as an assistant foreman in about one year if he is working on an extra gang and has a good foreman that will take an interest in him and try to show him how to do the work. On the other hand if he is not shown how to do the work and supervise, he will not qualify in two years.

It is hard for a man working on a section to qualify as an assistant foreman. If I were a roadmaster and found a good man working on a section, who was interested in a promotion, I would transfer him to an extra gang that had a good foreman I would let that foreman train him before he was promoted. Then he should work as an assistant foreman for at least six months before qualifying as foreman.

Three Factors Govern

By H. W. Kellogg
Engineer of Track, Chesapeake & Ohio, Detroit, Mich.

There are several factors that enter into the length of time the average trackman should work before he qualifies for promotion.

The first thing to consider is the man himself, his ability to learn, his ability to get along with and direct the other men in his own gang, and his willingness to accept responsibility.

Although two men may be equally intelligent, one man may grasp things more quickly and learn more rapidly than the other. However, the latter, after he has mastered the situation, can carry on his work as efficiently as the man who learns rapidly.

Some men are natural born leaders, be it of a few men or a large number. Other men acquire the skill of leadership through experience and their desire to better themselves. The latter type of man may have to work for a considerable length of time before he is able to instruct others and give orders. This is true even if his ambition is to get a position in a supervisory capacity.

There are many men who have the knowledge, ability and qualities of leadership required to make good foremen. However, they do not have confidence in themselves and are not willing to accept the responsibility of a supervisory position. I have seen many men of this classification. Some of them have waited years before they were willing to accept promotion. However, I am happy to say that when most of them do finally accept a foreman's position they make excellent foremen.

The second factor that determines how long a man must work before he can qualify for promotion, is the foreman of the section on which the trackman is working. A good track foreman should also be a good teacher and help and instruct a new employee under his supervision. Many track foremen are excellent trackmen but are not good teachers and will not try to help the men who wish to learn. As a result, a new man must learn as best he can and do as he is directed without knowing the reason why. On the other hand, there are also many track foremen who are good teachers. Review of the records of senior foreman on any division will show that those foremen who were good teachers developed many more good foremen and roadmasters from men who started on their sections.

The third factor that governs the length of time a man must work before he can qualify for promotion is seniority. Promotions from the ranks of trackmen to that of foremen are made on a seniority basis. This is the governing factor in a man's promotion.

It is impossible to set up a definite length of time a trackman must work before he is able to qualify for promotion. This varies in accordance with the several factors involved. However, the roadmaster should be on the alert to notice and encourage any new employee who shows promise of becoming a foreman. Then when there is a foreman's position open, to which his seniority entitles him, he will be qualified to accept the position. The time should not be less than six months and it may be a matter of years.

Two Years Required to Train

By C. Halverson
General Roadmaster, Great Northern, Willmar, Minn.

There has been considerable discussion of this question through the years. To start, I would say that the length of time a trackman must serve to acquire the necessary knowledge depends on his aptitude for learning, how interested he is in the work he is doing, and the type of foreman who is his superior.

Good foremen impress new employees, first, with the need for working safely, the need for concerning themselves with the safety of their fellow workers and to be always alert in correcting any unsafe practices that come to their attention.

The importance of safe operation of motor cars, or any other means of transportation of which he is in charge, is stressed daily. In so doing the good foreman sets a good example by strict observance of the rules set forth by the management.

The importance of track inspection follows. This includes such practices as recognition of defects in rails, proper maintenance of switches, checking for irregularities in track cross level, gage, superelevation of curves, good maintenance of grade crossings, and maintenance of drainage facilities in good order.

Higher train speeds require refinement in track maintenance. The forman must have the capacity for responsibility and be able to apply his knowledge to obtain the desired results.

A foreman's knowledge of the men under his supervision is an important factor in gaining their confidence in his leadership, and respect of his ability to perform his services in a manner that produces good work, safely done.

In my opinion these requirements will necessitate two years of service as a track laborer to qualify for the position of assistant foreman, and two years as assistant foreman to qualify as a foreman.

Other requisites of a foreman are character, integrity, loyalty to his employers, aggressiveness and an interest in the men under his supervision. These can be described as traits of human engineering.

Spiking and Bolting Operations

When laying rail, should the spiking operation be carried out ahead of, or behind, the bolting operation? Why? Explain.

Spike Behind Bolting Operation

By Sam Hanges
Section Foreman, Chicago & North Western, Wakefield, Mich.

I say, when laying rail, the spiking operation should be carried out behind the bolting operation. This is especially true if any amount of rail is to be relaid.

I believe the bolting operation can be carried on ahead of the spiking operation without too much delay. A pair of angle bars should be placed on the back end of each rail before it is placed in track. These bars should be secured with one bolt which should not be drawn up tightly. If this is done, no trouble will be encountered in joining the rails within the angle bar during the laying operation.

The expansion shims, which are placed in each joint, will also be held in place if the joint is bolted first. If the joints are not bolted first the rail will have a greater chance of moving, possibly causing tight joints. There would also be trouble in installing the remaining bolts if the rail should happen to move. This would affect not only the one joint but quite a few from that point on. If the joints are fully bolted and tightened before spiking, it would not be necessary to return to spike up the joints, and much of the job would be completed as the gang moves forward.

If rail is to be relaid in territory where the running surface is not too good and the rail were spiked first, one rail at a joint might be somewhat higher than the other. If the rail is not spiked the low rail can be nipped up easily so that the angle bars and bolts can be placed.

Probably the only spiking that should be done ahead of the bolters is at the centers to steady the rail for the Burro crane if one is used. If the rail is of heavy section and the surface smooth, no spiking is necessary to carry the crane.

Bolt First for Better Line

By E. S. Shandrew
Extra Gang Foreman, Southern Pacific, Oakland, Cal.

When laying rail, the bolting should be done ahead of the spiking. This will give a lot better line and gage. If spiking is done ahead of the bolting you will get a lot of cocked joints and bad line.

If tightening all of the bolts ahead of the spikers is too slow, the bolting machine operator can tighten two bolts in each joint. This will make safe track and also give good line. The bolting machine can then go back and tighten the remaining bolts after the spiking is done, if you only have one machine. If you have two machines, it is better to have the lead machine tighten two bolts and the back machine tighten the other two.

Tighten Bolts First

By M. A. Stell
Supervisor, Baltimore & Ohio, Point Marion, Pa.

When laying rail, bolts should be tightened ahead of the spiking because better gage and line will result. Power wrenches are usually used when laying rail. If bolts are tightened before spiking the rails will have a tendency to shape themselves to the proper curve or tangent without short kinks at the joints.

If spiking is done ahead of the bolting operation, you are bound to have short kinks in the rails. This is especially true at the joints. On curves the resulting gage at the joints will probably be wide when the high rail is laid and tight when laying the low rail.

When laying rail where traffic is heavy, use of the track can be had for only short periods, and it must be made safe as quickly as possible to permit trains to pass. In that case it may be necessary to tighten only two bolts ahead of the spiking so that the spiking can be done to get trains moving. It will then be necessary to go back and tighten the bolts.

All bolts should be tightened ahead of spiking operation if at all possible. You will always get a better job, and there will be a saving in the cost, if all the bolts are tightened first.

Proper Bolting Helps Curvature

By N. F. Alberts
General Foreman, Chicago, Milwaukee, St. Paul & Pacific, Chicago

Many years ago, when the refinement of line and gage was not considered important, the various sequences of the rail-laying operation were carried out in any way or manner necessary to get the rail laid.

In such cases refinement was often sacrificed in order to get the job done.

Since then, speeds have been greatly increased and the picture has changed. Refinements of line and gage at joints have now become an important factor.

This is especially true of curves

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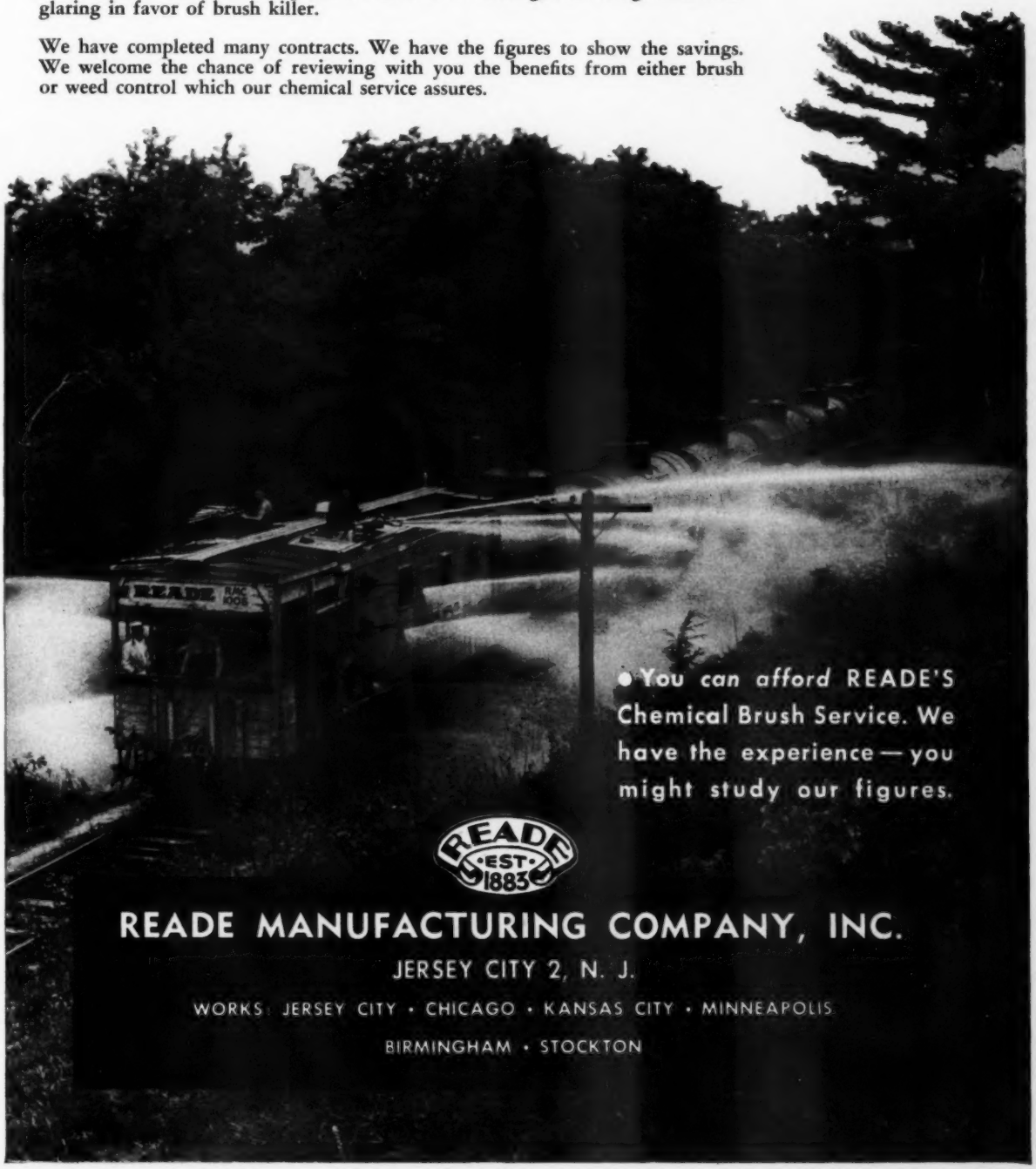

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with light or heavy curvature. If bolts are not drawn to full tension before the spiking of the rails takes place, kinked rails at the joints will be the result. Drawing bolts to full tension before the track is gaged and spiked will insure a true circle in a curve without abrupt angles at the joint.

In a well-organized rail laying gang, the rail-laying machine or rail crane can usually operate on new rail before it is bolted or spiked, except on curves of 3 deg or sharper.

A properly organized gang following the rail-laying machine does the following operations in order:

(1) Applys the joint bars and draws the bolts to proper tension with a power wrench.
(2) Squares up all the plates to properly fit the new rail.
(3) Gages the track and spikes the rail to proper gage.
(4) Fully spikes the rails.
(5) Tamps all loose or hanging ties with power tamper.
(6) Applys rail anchors.

This line-up should prevail on tangent track or curves up to 3 deg. On sharper curves, a power wrench and the gaging unit should be moved ahead of the rail-laying machine.

When laying the rail, the rail crane must hold the rail straight out while all the bolts are being drawn tight and to full tension with the power wrench. The rail is then lined into gage and spiked sufficiently to permit the rail-laying crane to pass over it. The full spiking then follows the rail-laying machine. This will avoid any irregularity of line and gage at the joints.

While we appreciate the fact that this procedure will, to some degree, slow up the rail-laying operation, in the long run it will result in a job well done.

While the question does not deal with the sequences of pulling spikes with power-spike pullers and uncoupling the old rail ahead with power wrenches, we would suggest, as a safety measure, that spike-pulling machines be always placed ahead of the power wrench. The first wrench uncoupling the old rail should operate at a distance of not less than four rail lengths from the last spike puller.

If bolts are removed from the old joints in advance of the spike puller, the uncoupled rail is liable to turn under the pressure of the power machine as the spikes are drawn. This may result in some workman injuring his toes while operating the machine.

Tighten Center Bolts First

By C. C. Van Stratten
Roadmaster, Missouri Pacific,
Jefferson City, Mo.

Since the joint has always been one of the headaches or chief maintenance problems of the track man, I do not feel that we waste any time or effort in seeing that it is properly cleaned, bolted and installed during the rail-laying operation.

In past years, with haste to get as much rail down as possible each day by hand methods, the joint was sadly neglected during the rail-laying operation. This was done with the thought in mind that the joints could be properly tightened and cared for behind the rail laying.

In this age particularly, all rail-laying gangs of any size are mechanized. Power track wrenches with adjustable tension ratings have taken a lot of the guess work out of the joint tightening.

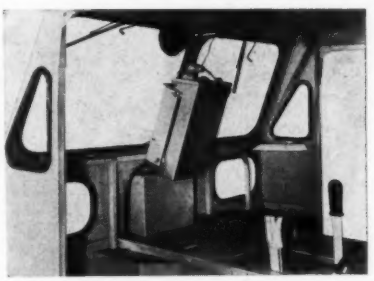
When laying rail, the best procedure is always to tighten the center bolts immediately after the rail is laid in place. Be sure, of course, that the rail is seated properly on the plates and is in line with the other rail end. This assures proper tension at the rail ends, the place where wear first starts. This should be done regardless of whether 4-hole 24-in bars or 6-hole 36-in bars are used. In the case of the 36-in bar, it is even better to tighten the four center bolts before gage spiking.

The tightening of the center bolts ahead of the gage spiking, and other work, has several advantages over the older method. First, it maintains proper joint expansion. Second, it prevents the slight variation of gage that is often found around joints that are not tightened prior to the spiking operation. Third, and more important, it provides equal bearing along the head and toe of the joint bar while the rail is still free to be drawn into place.

The proper procedure is as follows: Lay the rail in place upright and seated on the plates; tighten the center bolts with the first power track wrench; gage spike; and then follow immediately with another track wrench, which completes the tightening of the entire joint before the track is fully spiked. A week or two later, depending upon the amount of traffic, all bolts should again be gone over with a power wrench, which is adjusted to the same tension as originally used when the joints were tightened.

PRODUCTS
OF MANUFACTURERS

New, improved equipment, materials, devices



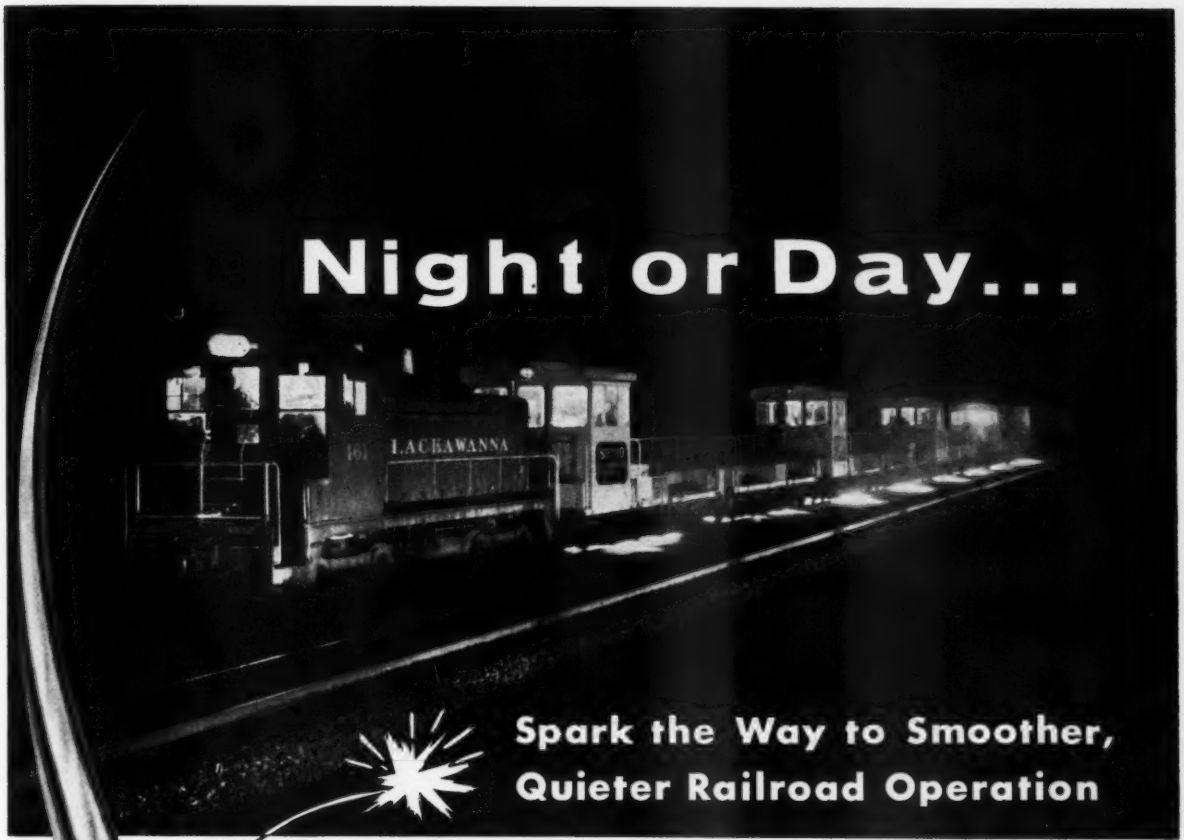
TWO-WAY RADIO FOR MOTOR CARS

FOR INSTALLATION on railroad motor cars, two-way mobile radio systems have been announced by the Federal Telephone & Radio Co., Division of International Telephone & Telegraph Corp., Clifton, N. J.

The two models available are the FT-153-10 for mounting in exposed locations, and the FT-156-10 for protected mountings. The units are said to be small, compact and rugged enough to be installed in hard-working motor cars. With the units work crews in the field are able to maintain radio - telephone communication from motor car to motor car, to "walkie-talkies," to fixed radio stations and to moving trains. The units have a 10-watt power output with a low standby battery drain. The receivers feature adjacent channel operation. The systems are reported to meet or exceed all FCC regulations and RETMA specifications.

ALUMINUM PASTE, RUST-INHIBITIVE

COMBINING the rust-inhibitive power of strontium chromate with the hiding power and reflectivity of aluminum pigment, the Reynolds Metals Company, Louisville, Ky., has announced the development of a new rust-inhibitive aluminum pigment. This product, which will soon be on the market, is a paste made up of strontium chromate and powdered aluminum.



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Available to Railroads on a contractual basis.

Just Ask the Railroads That have used us!

SPENO

FRANK SPENO RAILROAD BALLAST CLEANING CO., INC.
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It is expected that paint manufacturers will soon offer to the trade a paint, made to the new patented formula, which will contain this pigment. A single coat of the new paint is said to combine the benefits of a rust-inhibitive primer and a reflective aluminum top coat. The compound is claimed to be especially effective where salt water is involved. It is also stated that, while a single coat is not as good as a coat of primer followed by aluminum, it is better than a single coat of either the primer or aluminum.

CRANE ATTACHMENT

FOR USE in pile-driving work and for other purposes where a third hoist line is needed, the Bucyrus-Erie Company, South Milwaukee, Wis., has announced a third-drum assembly for mounting on its 38-B, 51-B and 54-B machines equipped with lifting crane or clamshell front ends.

According to the announcement, the auxiliary assembly equipment can be mounted on any of these models in the field, provided they do not have independent propulsion. The third-drum assembly comprises a clutch shaft and mounting, drum and drumshaft, boom equipment, and operating controls. The drum capacity is approximately 300 ft, using ¾-in cable. For a single-part line, maximum load is 10,000 lb and line speed is 160 ft per min.

"The Art of Track Raising"

Now available in pamphlet form

We have had many requests from readers for reprints of the series of articles on this subject published in the December, January and February issues of *Railway Track and Structures*. Written by Leo C. Blanchard, roadmaster on the Milwaukee, who also authored the series on "The Art of Track Lining", this new series on track raising is divided into three principal discussions, namely: "Learning the Fundamentals", "Using the Spot Board" and "Tamping Techniques"—all written in the language of the practical man.

To meet the demand for copies of these articles, they have been reprinted, all three in a single pamphlet. A limited number of copies are available, postage prepaid, at the following prices:

1 to 10	copies	—	$ 0.50 each
10 to 25	"	—	5.00 + 45 cents for each copy over 10
25 to 50	"	—	11.75 + 40 cents for each copy over 25
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Editor

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Dear Sir:

Please send me ..... copies of the pamphlet reprint of the articles on "The Art of Track Raising." Enclosed is $..... to cover the cost.

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(Checks or money orders should be made payable to Railway Track and Structures.)

CHEMICAL PAINT REMOVER

DEVELOPMENT of a new process for chemically stripping paint from railroad bridges and preparing the surfaces for repainting has been announced by Turco Products, Inc., Los Angeles. The new process, using Turcoat 3420 or Turco W.O. No. 1, is said to eliminate many common disadvantages of sandblasting, and to be of particular advantage at locations where sandblasting is not possible. The manufacturer claims that the new process cleans surfaces of old paint and removes rust from under the old paint as well as in bare spots.

Each of the spray-on phosphating materials is said to offer passivating action as well as cleaning action, in that the surface is microscopically etched and a light phosphate coating deposited. This coating forms a bond between the metal and the paint to assure adhesion of new paint coatings. Field use of the process employs a dual-purpose, high-pressure portable machine that generates up to 300 gal of water per hour. The water is heated to 180 deg F, and is used at 250-psi pressure.

Headquarters for a freight train 10,000 miles long

Headquarters for Yardmaster, Weighmaster, Hump Conductor and Yard Clerk, this new Fairbanks-Morse Track Scale on the Union Railroad is the center of activity in this busy terminal.

All traffic passes over this 200-ton capacity scale located in the 4 million dollar classification yard located in East Pittsburgh. In a year that tonnage averages more than 70 million tons, or a freight train 10,000 miles long.

When weighing a whole train or LCL, check with your Fairbanks-Morse Railroad Sales Engineer. He can draw on the experience gained in installing more scale capacity than all other scale manufacturers combined. Fairbanks, Morse & Co., 600 South Michigan Ave., Chicago 5, Ill.

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The Month's News
Railway Personnel

General

D. S. Thomson, vice-president, operation and maintenance, of the Canadian Pacific, has been named vice-president with jurisdiction over all lines of the CPR. At the same time **R. A. Emerson,** chief engineer, has been promoted to succeed Mr. Thomson as vice-president, operation and maintenance.

J. J. Swift, vice-president and general manager of the Lehigh Valley, has been appointed vice-president operations and maintenance, with headquarters as before at New York.

Ralph E. Sease, assistant general manager on the Central of Georgia and an engineer through training and experience, has been advanced to general manager at Savannah, Ga.

Mr. Sease, a veteran of 27 years with the C of Ga, was born at Prosperity, S.C., and was graduated in civil engineering from Clemson College in 1925. He worked with the Alabama State Highway Department and the ACL prior to joining the C of Ga as a draftsman in the engineering department at Savannah in November 1928. He was promoted to assistant engineer in 1935, and in 1941 was appointed supervisor track at Dothan, Ala. He later served in this same capacity at **Albany, Ga., and Columbus.** He was appointed supervisor of bridges and buildings at Savannah in 1945. A short time later he was advanced to terminal trainmaster at Atlanta, subsequently serving as division superintendent and superintendent of transportation-system. In January 1954 he was elevated to general superintendent of transportation and in July of that same year was promoted to assistant general manager.

W. J. Strout, vice-president—operations and maintenance, on the Bangor & Aroostook, has been elected executive vice-president, with headquarters at Bangor, Me.

Mr. Strout was born at Milo, Me., May 3, 1906, and attended Milo high school and the University of Maine where he received a B.S. degree in civil engineering in 1929. He began his railroad service with the B&A as a machinist's helper in 1926, later serving as a laborer in the stores and engineering department. In 1929 he was named assistant engineer, later being promoted to principal assistant engineer. He was advanced to chief engineer in 1940, serving in that capacity until being appointed chief engineer and mechanical superintendent in 1951. Mr. Strout became general manager-operations in 1953, and was advanced to vice-president-operations and maintenance last year. He is president of both the New England Railroad Club and the Main Association of Engineers.

Engineering

H. C. Daniel, Jr., and Rudolph Harlin, have been appointed assistant engineers on the Central of Georgia, with headquarters at Savannah, Ga.

E. L. Collette, division engineer on the Frisco at Fort Smith, Ark., has retired after 45 years of service.

C. A. Peebles, roadmaster at Springfield, Mo., has been promoted to assistant division engineer on the River division, with headquarters at Chaffee, Mo.

W. M. Dowdy, assistant supervisor of track on the Chesapeake & Ohio at Newport News, Va., has been promoted to assistant division engineer at Columbus, Ohio, succeeding **J. L. Southard,** who has been promoted.

B. F. Lyon, formerly assistant engineer on the Illinois Central at Chicago, has been named assistant engineer on the Chicago, South Shore & South Bend at Michigan City, Ind.

T. T. Word, roadmaster on the Santa Fe at Wellington, Kan., has been promoted to division engineer on the Panhandle division with headquarters at

LINCOLN SHIELD-ARC SAE
with Dual Continuous Control

FOR RIGHT TYPE ARC

FOR RIGHT ARC INTENSITY

SELECTS BEST ARC TO CUT WELDING COSTS
on maintenance-of-way, on construction

MORE Shield-Arcs are used for maintenance and construction than any other engine-driven welder in the world. Here's why:

WELDING IS EASIER, FASTER—Operator simply sets Lincoln's Dual Continuous Control for the right type arc and right arc intensity. Result—top speed and ease of welding on every job...in every position.

EFFICIENT, DEPENDABLE—Built for heavy-duty service. Shield-Arcs have Lincoln patented Idling Control to save fuel. Control allows engine to idle until arc is struck. Engine is then automatically regulated at correct speed for welding.

BENEFIT NOW. SEND FOR BULLETIN 1337 giving facts on complete line of Lincoln Shield-Arc engine-driven welders 200, 300, 400, 600 amp sizes. Write The Lincoln Electric Railway Sales Company, 11 Public Square, Cleveland 15, Ohio. Railroad representatives of:

THE LINCOLN ELECTRIC COMPANY
CLEVELAND 17, OHIO
The World's Largest Manufacturer of Arc Welding Equipment

Any Old RAILWAY AGES?

Watch for surprise announcement about prizes for finders of the oldest copies of affiliated *Railway Age*, the weekly which is soon to celebrate 100 years of continuous publication.

Look also for titles *Railroad Gazette* (before 1908) and *Western Railroad Gazette* (before 1870).

There may be gold in that old corner!

Only these 2 completely new PAYLOADER® tractor-shovels offer you all these features

the NEW
Model HU 1 cu. yd.
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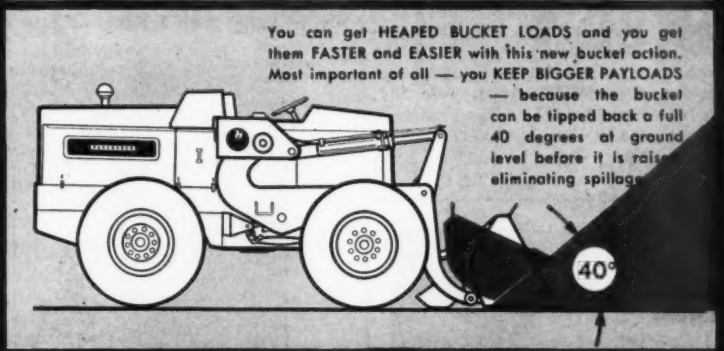
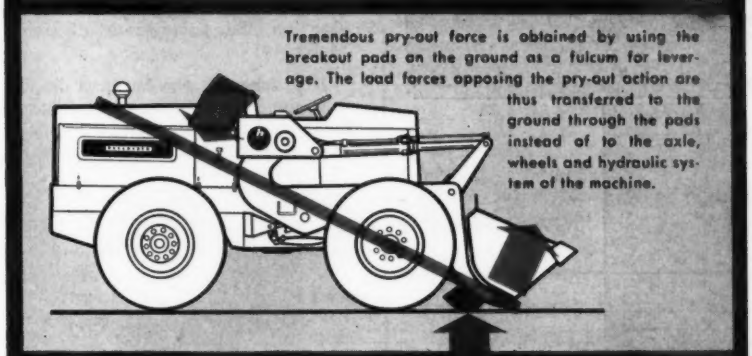


You can get HEAPED BUCKET LOADS and you get them FASTER and EASIER with this new bucket action. Most important of all — you KEEP BIGGER PAYLOADS — because the bucket can be tipped back a full 40 degrees at ground level before it is raised, eliminating spillage.

40 Degrees BREAKOUT at ground level with Tremendous pry-out action



Tremendous pry-out force is obtained by using the breakout pads on the ground as a fulcum for leverage. The load forces opposing the pry-out action are thus transferred to the ground through the pads instead of to the axle, wheels and hydraulic system of the machine.

SAFETY and STABILITY

Underslung boom-arm design keeps moving members out of operator's reach at all positions — without using safety guards and screens. Longer wheelbase and close, low, load-carry position provides maximum stability and balance.

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HOUGH PERFORMANCE

more horsepower per bucket capacity than any other wheel tractor-shovel. Either gasoline or diesel power available.

easy to operate. Fullest operator visibilty for safe, fast maneuvering; power-steering; minimum number of control levers. Foam-rubber molded seat and back cushions. Seat adjustable for operator comfort. Longer wheelbase and better balance add to riding comfort.

accessibility. Unusual accessibility for servicing and maintenance. Battery and oil reservoir are located under an easy-access cover just behind driver's seat. Sealed grease fittings. Exterior hydraulic line outlet provided for easy addition of hydraulically-operated accessories.

torque-converter drive in conjunction with 4-speed, full-reversing transmission provides precise, easy control and the widest possible range of speeds for both forward and reverse. Acts as a shock absorber for the entire power train.

other features. Closed, pressurized hydraulic system keeps dirt and air out of oil; powerful hydraulic brakes; double-acting hydraulic cylinders and chrome-plated piston rods; 12-volt electric systems on gas-powered models; forward and backup driving lights; tail lights.

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Send me full information on the new Model HH and HU "PAYLOADER" tractor-shovels.

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IH

Railway Personnel (Cont'd)

Wellington, succeeding **R. E. Knapp,** who has been transferred.

J. J. Healy, supervisor bridges and buildings on the Terminal division of the Boston & Maine at Boston, Mass., has been promoted to assistant division engineer on construction at Winchester, Mass.

H. F. Davenport, who has been appointed assistant to division engineer on the Illinois Central at Memphis, Tenn., (*RT&S*, April, page 58), was born at Grand Rapids, Mich., April 16, 1926. He attended the University of Michigan where he received a BS degree in transportation engineering in 1946, following which he began his railroad service with the Illinois Central as a junior engineering aid at Paducah, Ky. He later served in this capacity at Champaign, Ill., until being appointed assistant supervisor of track in December 1948. He was promoted to supervisor of track at Mendenhall, Miss., in July 1950, subsequently serving as supervisor of track at Tutwiler, Miss., and Corinth.

D. K. McNear, who has been promoted to construction engineer on the Southern Pacific with headquarters at San Francisco *RT&S*, April, page 58), was born July 20, 1925, at San Francisco, and attended the Massachusetts Institute of Technology, where he received a BS degree in civil engineering, and the Stanford University Graduate School of Business. He began his railway service with the SP as a technical student (rodman), working during the summers of 1948 and 1949. He was appointed instrumentman in July 1950, later being advanced to assistant engineer Class C, Class B and Class A in that order. In December 1952 he was advanced to general track foreman on the construction of Roseville yard, later serving in this same

D. K. McNear

capacity on the Sacramento division. He was promoted to assistant division engineer on the Sacramento division in March 1954.

B. J. Johnson, who has been promoted to division engineer on the Baltimore & Ohio at Cincinnati, Ohio (*RT&S*, April page 65), was born at Louisville, Ky.,

B. J. Johnson

February 14, 1923. He attended Purdue University where he received a BS degree in civil engineering in 1947. Following graduation he began his railroad service with the B&O as an assistant on the engineering corps at Cincinnati. He was advanced to assistant division engineer at Wheeling, W. Va., in 1950, later serving in this same capacity at Baltimore.

W. B. Knight, who has been promoted to assistant division engineer on the Pennsylvania at Baltimore, Md., (*RT&S*, April, page 58), was born at Taunton, Mass., June 10, 1918. He received a BS

A Burro Crane, its operator and two men on the rail will set a fast pace for the track gang to follow. Rail gangs equipped with a Burro Crane produce more work per shift at lower cost because Burros have the pace-setting speed and efficiency that helps them keep on schedule. Equally efficient with tongs, magnet, hook, bucket or dragline, Burro Cranes handle any job in stride. Fast travel speeds get them to the job in a hurry . . . heavy draw bar pull permits hauling work train and gang.

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- Fast travel speeds . . . up to 22 MPH
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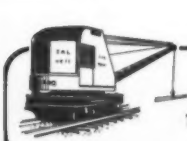

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degree in civil engineering from Northeastern University in July 1941, following which he joined the Pennsylvania at Jersey City, N. J., as an engineer apprentice. After serving with the PRR for one month he was furloughed for service with the armed forces, and upon his return in February 1946, he again served as an engineer apprentice at Jersey City until being appointed assistant supervisor of track at Niles, Ohio, in October of that year. He was transferred to

W. B. Knight

Philadelphia in February 1947, and was advanced to supervisor of track at Alliance, Ohio, in March 1948. He later served in this same capacity at Terre Haute, Ind., and Dennison, Ohio.

K. W. Schoeneberg, assistant division engineer on the Frisco at Chaffee, Mo., has been promoted to division engineer at Fort Smith, Ark., succeeding **E. L. Collette,** whose retirement is noted elsewhere in these columns. **K. E. Henderson,** assistant division engineer at Springfield, Mo., has been named division engineer on the Southwestern division (North) with headquarters at Tulsa, Okla.

A photograph of Mr. Schoeneberg and a sketch of his railroad career appeared in the June 1954 issue of *RT&S* on the occasion of his promotion to the assistant division engineer.

B. G. Gallacher, assistant division engineer on the Southern Pacific at Stockton, Calif., has been appointed construction engineer with headquarters at San Francisco, succeeding **D. K. McNear,** who has been transferred. **A. D. DeMoss,** assistant division engineer at Dunsmuir, Calif., has been named senior assistant division engineer, Western division, with headquarters at Stockton.

Track

C. E. Hutchinson has been appointed assistant supervisor of track on the Eastern division of the Pennsylvania with headquarters at Canton, Ohio.

W. D. Rigney, formerly with the New York Central, has been appointed supervisor of track on the Central of New Jersey with headquarters at Long Branch, N. J.

Romeo Lipper, assistant track supervisor on the Terminal division of the

(*Continued on page* 64)

There's a SIMPLEX JACK to Do Every RAILROAD JOB Faster-Easier

Fast Acting TRACK JACKS

15 ton capacity. The jacks set much more firmly and stand straighter under tie (without damage) or rail, due to large area toe lifts. Trip from either side. Two models have light weight aluminum housings.

ALSO: Tie removers and replacers.

Standard Speed BRIDGE JACK

The new A2515 25-ton jack has an aluminum alloy housing, which weighs only 40 pounds. 9-in. lift eliminates re-setting in bridge work. Recommended for use with jack support.

ALSO: A complete line of hydraulic jacks and pullers.

Versatile BRIDGE JACK

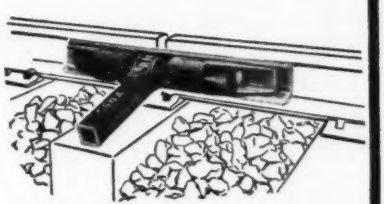
Lifts, pushes, pulls 15-tons on cap, toe or bolt attachment. Ideal for shimming, lining, painting and replacing timber decks. Two base sizes to fit between ties. Ratchet lowering for safety. Double socket permits use in close quarters.

ALSO: Push and pull jacks for piling.

Time-Saving TIE SPACER

Straightens, Spaces Ties. Pumps Rails. Easily applied and removed. Slides along top of rails.

RAIL EXPANDERS for the Maintenance and Signal Departments



Permits *one* man to replace a rail pounding crew! For lining crossings and switches, pushing or pulling continuous rail, controlling expansion or contraction with no interruption of service. With lever socket locked down, nothing protrudes above rail head.

Pole Pulling and Straightening Jacks for the Signal Department

Two sizes, 5 and 15 tons for pulling or straightening all sizes of poles. Pivots on base, when desired, to any angle. Can also be used for guy wire tightening or for pulling underground cable. Model A1538—15-ton capacity—available with aluminum housing which reduces weight 35 pounds.

ALSO: Cable Reel Jacks for drums 30- to 96-in. diameter.

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SIMPLEX JACKS

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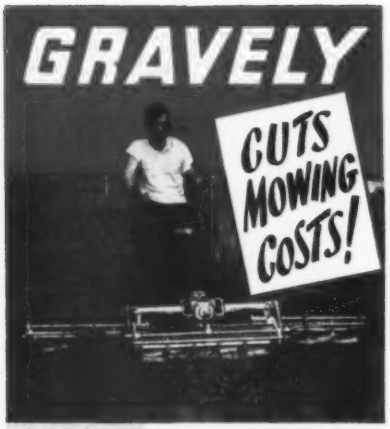

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YOU CUT MOWING COSTS because ONE Gravely Tractor powers all the tools shown — and more — 21 in all!

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SAVE MANPOWER too, since ONE man, with ONE Gravely, can do the upkeep jobs of a crew of eight in the same time! Mechanize the upkeep jobs — get *more* done *better*, in *less* time.

3 SNOW REMOVAL TOOLS afford YEAR-ROUND USE, in every season — an example of Gravely's versatility.

MORE for your MONEY!

5-HP — more than twice the power of the usual power mower . . all-gear drive, two speeds forward and REVERSE . . . 21 tools available!

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Send for 24-page Booklet, "Power vs Drudgery", that shows you how and why you get more for your money when you get Gravely.

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Manufacturers' Literature

Following is a compilation of free literature, pamphlets and data sheets offered by manufacturers to the railroad industry. Circle the number(s) on the coupon below to receive the desired information; the requests will be sent direct by the manufacturers.

1. **DIESEL ENGINES.** *Ingersoll-Rand.* 20-page colorful bulletin (10,040) describes the features of the Type S and SS heavy duty diesel engines in sizes from 375 to 1000 hp.; gives complete data on lubrication, cooling and fuel injection systems.

2. **SUBDRAINAGE STRUCTURES.** *Armco Drainage & Metal Products.* 4-page bulletin (12354) "Underground Pipe That Cures a Surface Headache" discusses importance of adequate subdrainage structures, states that 80% of costly surface failures on railroads are caused by harmful underground water; includes on-the-job photos.

3. **DIAPHRAGM PUMP.** *Rice Pump & Machine.* Bulletin (55DP) discusses, illustrates and gives specifications on the new portable 4" diaphragm pump which combines 2 single units to double the conventional pumping capacity.

4. **PLASTIC PIPE.** *American Hard Rubber.* 6-page 2-color bulletin (80-A) gives complete data on Dur-Ace general-purpose corrosion-resistant plastic pipe with great impact strength and toughness; gives general properties, chemical resistance tables, standard sizes, pressures, and prices of pipe, fittings and diaphragm valves.

5. **TRACTOR-SHOVEL.** *Frank G. Hough Co.* 16-page 2-color 3-hole punched catalog (246) describes, illustrates and gives specifications on the Hough Payloader model HF and HFH; includes on-the-job photos and cross-section drawings.

6. **REFLECTIVE MARKING.** *Prismo Safety Corp.* 4-page booklet (R-754) "Prismo Reflective Railway Marking—The Modern, Convenient and Economical Way to Reflectorize Signs and Rolling Stock" gives complete details on Prismo reflective marking materials and the Rain-Pruf Reflecto-Kit; includes actual on-the-job photos.

7. **TIE PADS.** *Bird & Son.* 12-page 2-color profusely illustrated booklet "A 16-Year Record of Performance Showing What The Right Tie Pads Can Do to Slash Your Costs" completely describes in words, photos and diagrams Bird tie pads.

8. **EXCAVATOR.** *Caterpiller Tractor.* Broadside (717) describes, illustrates and gives specifications for the No. 6 Traxcavator; oversize cutaway drawing shows all working parts; includes specific attachments.

9. **RAIL CROPPER.** *Racine Hydraulics & Machinery.* 4-page folder (712) describes, illustrates and gives specifications on "Racine Rail Cropping Machine", the model 33-CX hydraulic heavy duty production metal cutting machine.

10. **FINISHES FOR ALUMINUM.** *Aluminum Company of America.* 48-page multi-color booklet (AD 456) "Finishes for Alcoa Aluminum" with beautiful full-color photos gives comprehensive and informative description of many ways appearance and performance characteristics of aluminum can be changed.

11. **ELECTRICAL TAPES.** *Permacel Tape Corp.* 4-page 2-color brochure "Permacel 2 in 1 Electrical Tapes" describes, illustrates and gives in chart form technical data on the one tape that does two jobs—describes and compares old method with the new.

12. **RAIL ACCESSORIES.** *The Nolan Co.* New catalog on a group of essential service products for railroads contains photos, specifications and details of bumping posts, portable derails, car blocks, car stops, blue flags, rail skates, track dollies, tool and supply cars, rerailers, lifts, and hand trucks.

13. **PRINTED CIRCUITS.** *Cornell-Dubilier Electric Corp.* 8-page booklet (PRT 255) describes in detail the application, uses (test equipment, TV, walkie talkie, etc.), and advantages of printed circuits, as well as technical data to aid in design or planning of printed circuitry.

14. **TRACTOR.** *Caterpillar Tractor Co.* 4-page booklet (31496) describes, illustrates and gives specifications on the completely new Caterpillar D8 Tractor, in both torque converter and direct drive models.

15. **ACOUSTICAL PLASTIC.** *Vermiculite Institute.* New booklet "The Silent Treatment", covering vermiculite acoustical plastic and its application, contains table of physical data, standard specifications for manual and machine application, and sketches of 2 constructions granted 4-hour fire ratings.

16. **GROUT REQUIREMENTS.** *The Master Builders Co.* Handy pocket-size card for estimating grout requirements of heavy equipment, machinery, anchor bolts, building columns, and bridge seats.

17. **ADHESIVES & COATINGS.** *Minnesota Mining & Mfg. Co.* 4-page 2-color folder (ZIPF) "3M Brand Adhesives and Coatings for Insulation" includes photos and 2 comprehensive charts serving as convenient guide to the materials and their uses and characteristics.

Reader Service Department **JUNE, 1955**
Railway Track and Structures
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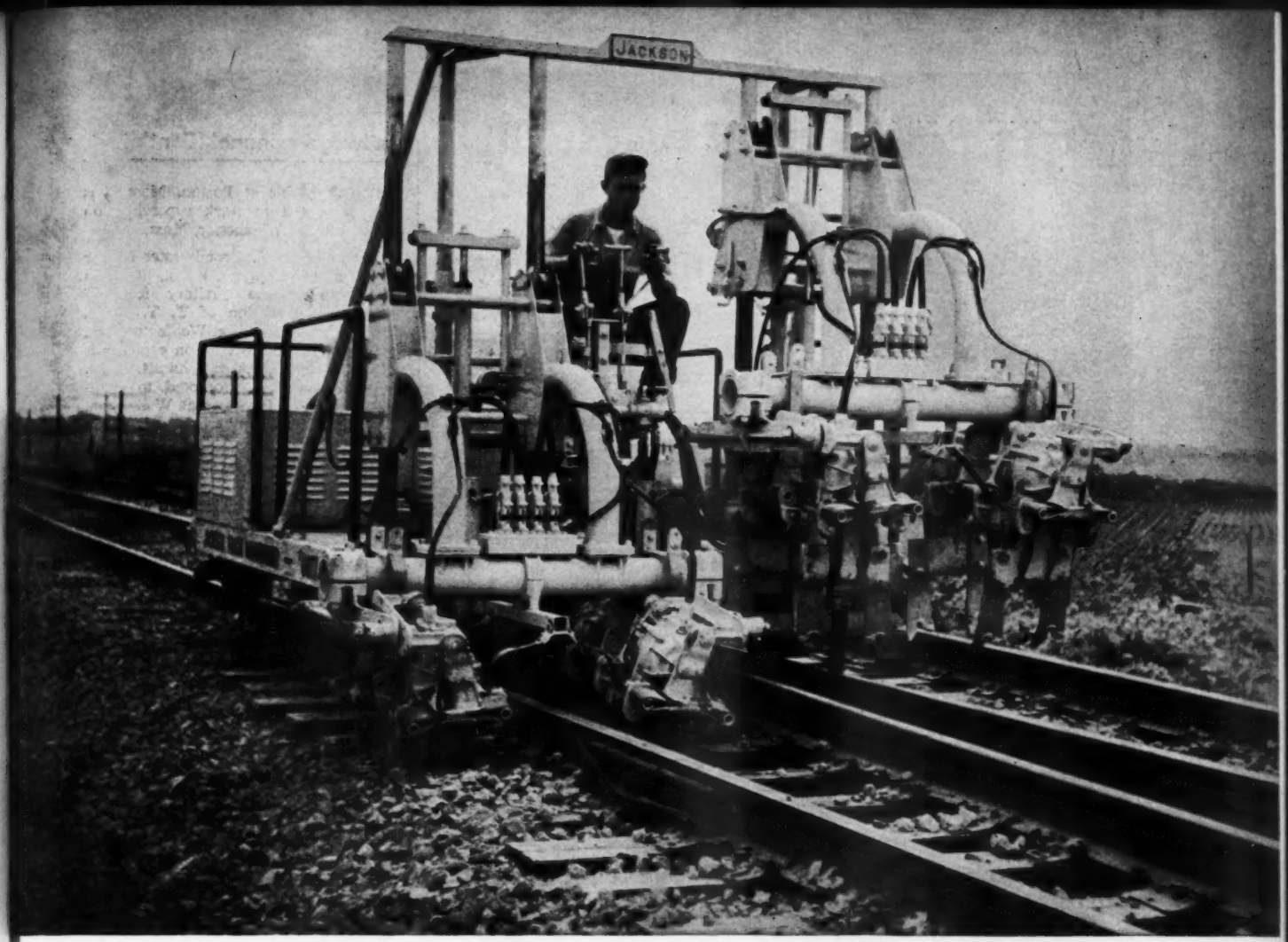

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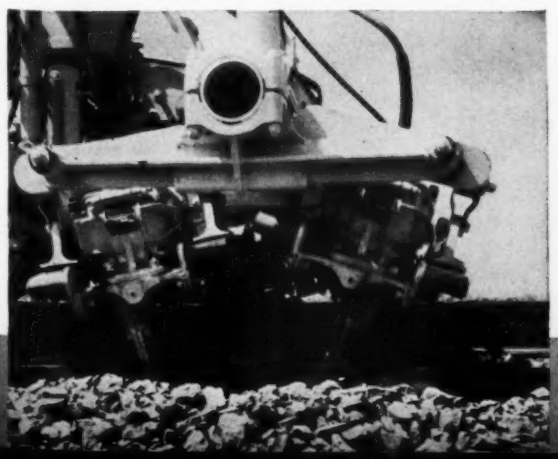
OVERWHELMINGLY FIRST CHOICE

of those maintenance-of-way chiefs who are looking for the best means of both putting up and maintaining finest track.*



The more you investigate, the more you compare, the more you will appreciate how outstandingly superior the JACKSON TRACK MAINTAINER is. It handles each and every phase of ballasting with peak efficiency regardless of type of ballast used or conditions encountered. Let us give you the pertinent facts. Just drop us a line, wire or phone.

****Acquirement plans to fit your needs!***

JACKSON VIBRATORS, INC.

LUDINGTON, MICHIGAN

THORITE

Nonshrink grouting compound

patches mortar joints between glazed tile.

Clean, 20 minute setting

valuable for many uses!

Use THORITE for patching blistered concrete, where reinforcing rods are exposed and corroded, for patching cornices, sills, lintels, belt courses, grain elevators, bridges, underpasses, reservoirs, dams, water filtration plants.

SECURING REINFORCING RODS INTO CONCRETE

Surface and reinforcing rods are sandblasted and thoroughly cleaned. An application of Thorite, by brush, over rods and concrete, previous to filling patch with Thorite, by trowel, is made.

Get our pictorially described literature
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STANDARD DRY WALL PRODUCTS INC.
NEW EAGLE, PENNSYLVANIA

Railway Personnel (Cont'd)

Boston & Maine at Boston, Mass., has been promoted to track supervisor on construction at Winchester, Mass.

C. C. Chamberlin, roadmaster on the Santa Fe at Wellington, Kans., has been transferred to the territory formerly under the jurisdiction of **T. T. Word,** with headquarters still at Wellington. Mr. Word's promotion to division engineer is noted elsewhere in these columns. **R. M. DeMoss,** has been promoted to roadmaster with headquarters at Wellington, succeeding Mr. Chamberlin.

H. F. Kanute, assistant engineer on the Frisco at Springfield, Mo., has been promoted to roadmaster at that same point, succeeding **W. E. Brockmeier,** who has been transferred to another territory with headquarters remaining at Springfield, succeeding **C. A. Peebles,** whose promotion to assistant division engineer is noted elsewhere in these columns.

E. H. Weiszbrod, has been appointed roadmaster on the Sante Fe with headquarters at Belen, N. M.

N. P. Galyon has been appointed assistant track supervisor on the Southern (Alabama Great Southern) with headquarters at Chattanooga, Tenn.

J. B. Mallory, Jr., who has been promoted to track supervisor on the Southern at Orangesburg, S. C. (RT&S, May, p. 66), was born at Statesville, N. C., July 13, 1926. He attended The Citadel where he received a BS degree in civil engineering in 1950, and began his railway service with the Southern in November 1951. He was appointed student apprentice at Richmond, Va., in November 1952, and was promoted to assistant track supervisor at Greensboro, N. C., in November 1953. He later served as assistant track supervisor at Columbia, S. C., before receiving his recent promotion.

P. K. Cruckshank, who has been promoted to general track inspector on the New York Central at New York (RT&S, May, p. 64), was born September 25, 1923, at Cambridge, Mass. He attended the Massachusetts Institute of Technology where he received a BS degree in civil engineering in 1948, and began his railroad service as a draftsman on the NYC at Boston in June 1948. He was promoted to assistant engineer at that point in September 1948, serving there until being appointed assistant supervisor of track at Remsen, N. Y., in June 1953. From October 1954 until the time of his recent promotion, Mr. Cruckshank served on the road's Methods and Procedures Committee at New York.

Bridge and Building

J. J. MacDonald, assistant supervisor bridges and buildings on the Boston & Maine, has been promoted to supervisor bridges and building on the Terminal division at Boston, Mass., succeeding **J. J. Healy,** whose promotion to assistant division engineer is noted elsewhere in these columns. **F. A. Ingalls,** assistant engineer, has been appointed assistant

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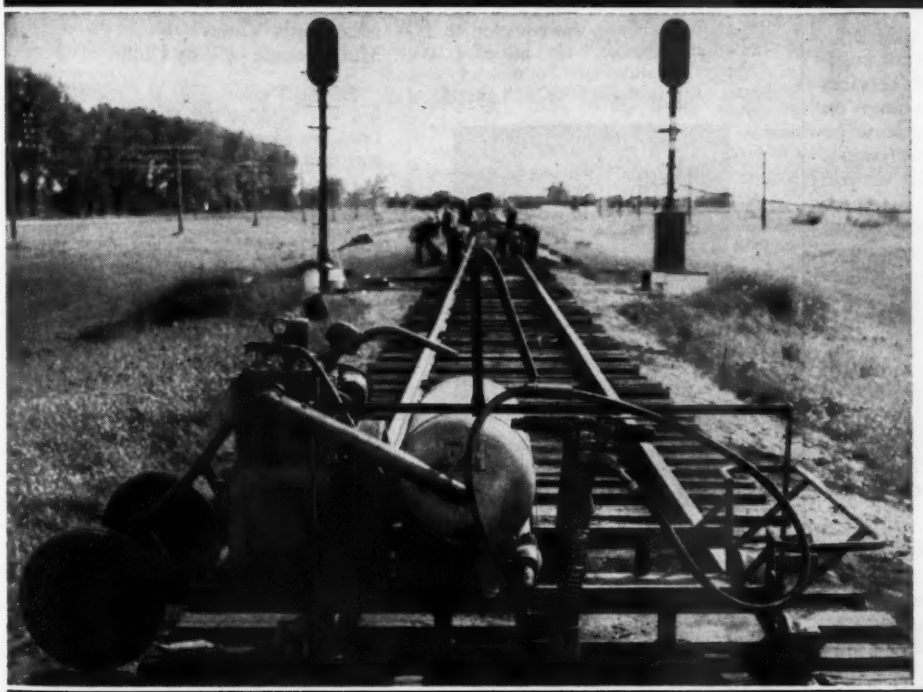

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Designed primarily for use by tie renewal gangs. Various other pneumatic tools can also be operated with it when not being used for spike driving.

Brakes are automatically applied to 2 of the 4 flanged wheels to hold the machine in place when spikes are being driven.

When pressure is applied to the push handle the brakes are automatically released and the entire unit rolls easily on roller bearings.

Two lever operated pneumatic tired set-off wheels permit removing the unit from the track in less than a minute by two men.

COMPRESSOR: 55 C.F.M. Duplex Cylinder

ENGINE: Wisconsin Twin Cylinder, 13 H.P.

DRIVE: Multiple V-Belt

HAMMER: THOR 60-pound

TANK: A.S.M.E. Standard with Safety Valve

FRAME: All steel, welded

TRACK WHEELS: 6-inch roller bearing

SET-OFF WHEELS: 8" x 4.00 pneumatic-tired, roller bearing

BRAKE: Two-wheel, automatic applied

WEIGHT: 760 pounds

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Railway Personnel (Cont'd)

supervisor bridges and buildings to replace Mr. MacDonald.

R. E. Shamblin, assistant supervisor bridges and buildings on the Scioto division of the Norfolk & Western, has been promoted to supervisor of bridges and buildings on the Pocohantas division with headquarters at Bluefield, W. Va., succeeding **C. P. Russell** who has retired after nearly 50 years of service. **C. B. Gibson, Jr.,** engineering inspector, has been appointed assistant supervisor bridges and buildings on the Scioto division replacing Mr. Shamblin.

Mr. Shamblin was first employed by the N&W as a carpenter in November 1936, and was promoted to assistant special steel bridge inspector in May 1945. He was advanced to assistant supervisor of bridges and buildings on the Scioto division in July 1948.

M. A. Beringer, whose promotion to superintendent of bridge erection on the Illinois Central at Chicago was announced recently (RT&S, May, p. 66) was born in Unionville, Pa., December 11, 1901. He attended high school at Tyrone, Pa., and began his railroad service with the IC in February 1921. Starting as a B&B carpenter at New Orleans, Mr. Beringer was promoted to assistant B&B foreman in June 1923, and to B&B foreman in October 1924. He was promoted to B&B supervisor on the Vicksburg division in September 1940, remaining at that point until being appointed system bridge inspector in January 1942. He served in this position until his recent promotion to superintendent bridge erection system.

F. E. Taggart, whose retirement as superintendent bridge erection on the Illinois Central was announced recently (RT&S, May, p. 66), was born March 25, 1885, at Chicago. He attended the Armour Institute of Technology and began his railroad service with the IC as

F. E. Taggart

clerk in the bridge department in July 1902. Between 1903 and 1912, he served as a draftsman and designer, and in September 1912 was promoted to assistant engineer to superintendent of bridges. He was named superintendent of bridges in 1932.

Obituary

Cornelius Jacoby, valuation engineer on the Southern, died March 9 in Washington, D. C.

Albert E. Walker, construction engineer on the Coast Lines of the Santa Fe at Los Angeles, Calif., died February 5.

William A. Wallace, retired assistant engineer on the Rock Island, died recently at Fairbury, Neb.

Theodore Bloecher, retired assistant office engineer on the Baltimore & Ohio, died recently.

Association News

Metropolitan Maintenance of Way Club

The annual outing of the club, with the usual program of sports with prizes for the winners, will be held this year on June 7 at the Wayne Country Club, Preakness, N. J.

In the election of officers, held at a recent meeting, A. H. Whisler, assistant engineer, Pennsylvania, was promoted from first vice-president to president; W. E. Kropp, supervisor maintenance of way equipment, Lehigh Valley, was advanced from second vice-president to first vice-president; W. W. Chaffee, general track supervisor, New Haven, was elected second vice-president; and John S. Vreeland, vice-president, Simmons-Boardman Publishing Corporation, was re-elected secretary-treasurer.

Mississippi Valley Maintenance of Way Club

The final meeting of the current season was held at the DeSoto Hotel, St. Louis, on May 9, attended by 196 members and guests. The principal speaker was A. Carl Weber, director of research and engineering, Laclede Steel Company, St. Louis.

Officers for the ensuing year were elected. E. L. Anderson, chief engineer, Frisco, was advanced from first vice-president to president; J. L. Loida, chief engineer, Illinois Terminal, was moved up from second vice-president to first vice-president; T. S. Carter, chief engineer, Missouri-Kansas-Texas, a director of the club, was elected second vice-president; and P. E. Odom, special engineer, office of vice-president-operations, Frisco, was re-elected secretary-treasurer.

Three members were elected to the Executive committee as follows: C. I. Van Arsdalen, division engineer, Illinois Central; W. M. S. Dunn, general roadmaster, Nickel Plate; and W. E. Gardner, principal assistant engineer, Wabash.

In his annual report as secretary-treasurer, Mr. Odom stated that, at the close of its fiscal year, the club had a total membership of 753.

American Railway Engineering Association

The General Committee of the Engineering Division, AAR, and the association's vice-president, Operations and Maintenance Department, have reviewed and approved all of the Manual recommendations adopted at the AREA convention in March. The 1955 annual supplement containing the revisions, is expected to be out sometime in June. Pending issuance of the supplement, users of the Manual are cautioned that the current Manual is incomplete to the extent that it does not include matter adopted at the 1955 convention.

Six of the association's committees have scheduled meetings to be held during the month of June. These are: Masonry—June 2-3 at the Sheraton-Mt. Royal Hotel, Montreal, Que.; Highways—June 23-24, Detroit, Mich.; Water, Oil and Sanitation Services—June 14, association headquarters, Chicago; Yards and Terminals—June 20-21, Schenley Park Hotel, Pittsburgh, Pa.; Economics of

Organizations

American Railway Bridge and Building Association—Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5. Next annual meeting, September 19-21, 1955.

American Railway Engineering Association—Neal D. Howard, Secretary, 59 E. Van Buren street, Chicago 5.

American Wood-Preservers' Association—W. A. Penrose, Secretary-treasurer, 839 Seventeenth street, N. W., Washington 6, D. C.

Bridge and Building Supply Association—L. R. Gurley, Secretary, 201 North Wells street, Chicago 6.

Maintenance of Way Club of Chicago—S. Kosco, Secretary-Treasurer, 135 East Eleventh place, Chicago 5.

Metropolitan Maintenance of Way Club—Secretary, 30 Church street, New York.

Mississippi Valley Maintenance of Way Club—P. E. Odom, Secretary-Treasurer, Room 1008, Frisco Building, 906 Olive street, St. Louis 1, Mo.

National Railway Appliances Association—Kenneth Cavins, Secretary, 310 S. Michigan avenue, Chicago 4; Lewis Thomas, Assistant Secretary, 59 East Van Buren street, Chicago 5.

Northwest Maintenance of Way Club—L. C. Blanchard, secretary-treasurer, Room 27, Milwaukee Depot, Minneapolis 1, Minn.

Railway Tie Association—Roy M. Edmonds, Secretary-Treasurer, 1221 Locust street, St. Louis 3, Mo. Next annual meeting, October 26-28, Peabody Hotel, Memphis, Tenn.

Roadmasters' and Maintenance of Way Association of America—Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5. Next annual meeting, September 19-21, 1955.

Track Supply Association—Lewis Thomas, Secretary, 59 E. Van Buren street, Chicago 5.

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Look what you get in the new CR-35!

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You don't need work trains for scattered maintenance jobs

D Tournapull self-loads, hauls, spreads, and dozes. It can repair washouts, trim side-slopes, cut ditches, spread ballast, build bridge approaches, stockpile and reclaim coal, and plow snow. It "runs" job-to-job at 28 mph. Capacity is 7 yds. heaped . . . 9 yds. with sideboards.

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This rubber-tired off-track tool drives anywhere under its own power. It takes the shortest route . . . along the right-of-way, over paved highways, or cross-country. A phone call sets "D" in action. Operator just hops on and goes! 25 miles is less than an hour away.

On the job, the one man and one machine load, haul and spread, traveling at speeds up to 28 mph instead of the 3 to 7 mph of a crawler-tractor. It never interferes with revenue traffic. It works independently, self-loading on small jobs. 2 "D's" can push-load each other for team operations on big ones.

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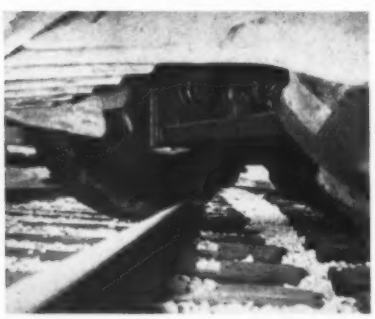
Invite us to discuss your earthmoving problems. You can have confidence that we will recommend only the right tools for YOU, because no company has a greater interest in railroad success and economical operation. For decades, Westinghouse has supplied the best in brakes, switch and signal equipment. Now, through their wholly-owned subsidiary, LeTourneau-Westinghouse, they supply you with the best in off-track equipment, as well. May we have one of our earthmoving specialists call on you soon?



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Association News (Cont'd)

Railway Location and Operation—June 9-10, Milwaukee, Wis.; Waterproofing—June 1-2, Purdue University, Lafayette, Ind.

V. H. Doyle, assistant to comptroller, Chesapeake & Ohio, Richmond, Va., has been appointed vice-chairman of Committee 11—Records and Accounts. He succeeds L. W. Howard, who in leaving the Illinois Central recently to become assistant land and tax commissioner on the Chicago & Western Indiana and the Belt Railway of Chicago, resigned as vice-chairman of that committee.

Northwest Maintenance of Way Club

The final meeting of the season was held April 28 at the Midway Civic Club in the Twin Cities. Reports were made by outgoing officers, indicating that this past year has been a good one for the club. The secretary's report showed membership for the year reaching a high of 357, a gain of 31 over a year ago.

New officers were elected and installed at the meeting. J. M. Gustafson, bridge engineer, Minneapolis & St. Louis, was named president, and R. R. Manion, chief engineer, Great Northern, was elected first vice-president. I. W. McPherson, vice-president, Minneapolis, Northfield & Southern, was advanced to second vice-president; J. S. Loeffler, manager railroad sales, Armco Drainage & Metal Products, Inc., was named executive secretary; and L. C. Blanchard, roadmaster, Milwaukee, was re-elected secretary-treasurer. Elected to the Executive Board for a two-year term were: W. F. Arksey, engineer water service and fuel facilities, Great Northern; S. H. Knight, supervisor work equipment, Northern Pacific; and B. F. McGowan, superintendent of signals, Soo Line.

The program at the meeting included a talk by John E. Hoving, assistant chief engineer, Northern Pacific, describing the raising of the NP bridge at Pasco, Wash. Mr. Hoving used slides to illustrate his talk. In addition, Robert M. Hoover, president, Kansas City Bridge Company, showed a 30-in sound movie in color on the same project. The movie was entitled "Moving Day," and described the 12-hr job of replacing the swing span on the Pasco bridge with a new lift span.

Western Wood-Preserving Operators' Association

Ralph F. Dreitzler, general manager of the West Coast Wood-Preserving Company, was elected president of the Western Wood-Preserving Operators' Association at its annual meeting held April 13 at the Palace Hotel, San Francisco. Mr. Dreitzler succeeds Paul D. Christersen of Pope & Talbot, Inc. James McGreger, McCormick & Baxter Creosoting Co., was named the new vice-president; V. G. Monahan, Cascade Pole Company, is the new treasurer; and R. F. Gillespie, J. H. Baxter Company, was named secretary. William Land, National Wood-Treating

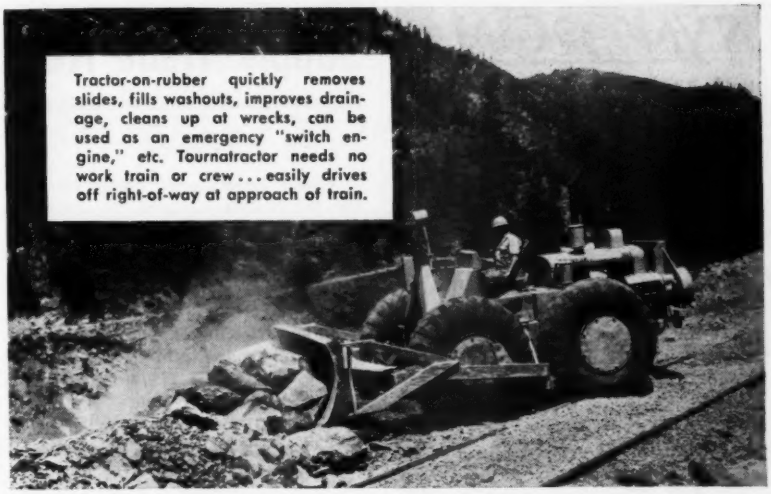
Company, was elected to the board of directors as representative of the California industry, and W. R. Jackson, Baxco Corporation, was selected as industry director to the West Coast Lumbermen's Association board. Ben S. Sawyer, Jr., and William R. Bond were re-elected field engineers.

Maintenance of Way Club of Chicago

The annual meeting of the club was held at the Hamilton Hotel, Chicago, on May 2. The main feature of the program consisted of the showing of a moving picture, produced by the United States Steel Company, tracing the development of iron ore deposits in Venezuela. Preliminary remarks were made by Burt Shauger, sales representative for U. S. Steel. A total of 200 members and guests attended the meeting.

In the election of officers, N. D. Howard, secretary, American Railway Engineering Association, was advanced from first vice-president to president; R. H. Beeder, assistant chief engineer, Santa Fe System, and a director of the club, was elected first vice-president; F. J. Corporon, superintendent way and structures, Chicago, South Shore & South Bend, also a director, was elected second vice-president; M. H. Dick, editor, *Railway Track and Structures,* was re-elected executive secretary; and S. Kosco, chief clerk, division engineer, Illinois Central, was elected secretary-treasurer. Mr. Kosco succeeds E. C. Patterson, chief clerk to the chief engineer-maintenance, Chicago & North Western, who had submitted his resignation after seven years of service to the club. A desk fountain-pen set was presented by the club to Mr. Patterson in appreciation of his service to the organization.

Two new directors were elected to fill the unexpired terms of Mr. Beeder and Mr. Corporon. These are B. O. Johnson, assistant engineer, Milwaukee Road, Chicago; and T. H. Taylor, assistant engineer, Pennsylvania, Chicago. Three new directors were elected for two-year terms: W. A. Buchmaster, assistant division engineer, Baltimore & Ohio Chicago Terminal; F. H. McKenney, engineer of track, Burlington, Chicago; and P. J. Wolfe, sales manager, Maintenance Equipment Company, Chicago.



Tractor-on-rubber quickly removes slides, fills washouts, improves drainage, cleans up at wrecks, can be used as an emergency "switch engine," etc. Tournatractor needs no work train or crew . . . easily drives off right-of-way at approach of train.

At a moment's notice...

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In less than 4 minutes, Tournatractor travels a mile under its own power to handle any railroad maintenance job in your yard or along the right-of-way. This 19 mph tractor does not damage tracks or switches, does not trip automatic block signals. It handles a wide variety of jobs quickly—cleans drainage ditches, removes slides, cuts down banks, fills washouts, reinforces causeways and bridge approaches. 1 man and 1 machine can do many of these and similar maintenance tasks *in a single day.*

Cuts dozing time in half. Tournatractor not only gets to jobs in less time than crawler-tractors . . . it also finishes them sooner. Four speeds forward to 19 mph and two speeds reverse to 8 mph help you complete most tractor assignments in as little as half the time that it takes the average crawler.

Compare Tournatractor's advantages with those of other tractors used in your division. You'll see why major railroads and dirtmovers are adding modern Tournatractors to their equipment fleets.

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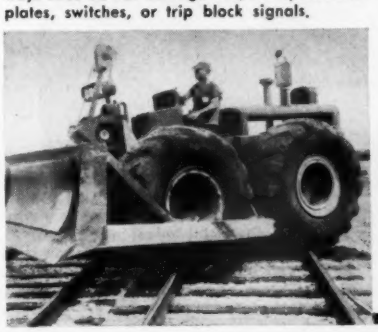
Tournatractor drives anywhere without planking. It follows the track or travels by highway. Tires do not damage ties, rail spikes and plates, switches, or trip block signals.



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"Belt-Drive" ELECTRIC SAWS

8" and 10" blades 2-11/16" and 3-1/" cuts

No air compressor needed.

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Spike Drivers

"Self-Contained" DIESEL PILE HAMMERS

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Supply Trade News

General

Armco Drainage & Metal Products, Inc., Great Lakes division, has announced the opening of a new office at 20 N. Wacker Drive, Suite 2828, in Chicago.

Personal

William R. Ganser, Jr., structural engineer, author and lecturer on engineered timber construction, has been named to the post of research engineer at the lumber and wood products laboratory of Timber Engineering Company, Washington, D. C.

Edward W. Kush has been appointed sales agent for the Railway Appliance Division of the **True Temper Corporation** at Omaha, Neb. Mr. Kush, supplementing the firm's regular sales force, will serve railroads with headquarters in Omaha and Denver, Colo.

E. A. Condit, president of the **Rail Joint Company, Inc.,** has been named chairman, and **H. L. Lansing,** vice-president and chief engineer, has been named president, both with headquarters as before at New York. Mr. Condit will remain as vice-president and director of **Poor & Co.**

Henry D. Hughes has been named to head the sales organization of **Reilly Tar & Chemical Corp.,** at Dallas, Tex.

Mon-O-Coach, Inc., Louisville, Ky., has appointed six railroad equipment representatives to handle sales of the new all-aluminum Mon-O-Coach trailer for off-track housing of maintenance forces. These are: **J. B. Akers, Jr.,** Suite 1102, DuPont Circle Building, Washington 6, D. C.; **Harold L. Emerson,** 319 N. Fourth Street, St. Louis, Mo.; **Ralph A. Corley, Jr.,** 30 Church Street, New York 7, N. Y.; **Robert J. Wylie,** Pioneer Building, St. Paul 1, Minn.; **Russell E. Long,** Mississippi Supply Company, 80 E. Jackson Boulevard, Chicago 4; and **Caesar Baldassari,** 420 Market Street, San Francisco 11, Cal.

William H. Zepp, who has been named Western District sales manager for Templeton, Kenly & Co., at San Francisco. Mr. Zepp's territory will cover the states of California, Arizona, Nevada, Oregon and Washington.

Thomas J. McGinnis, assistant to the general manager of the Wood Preserving Division of Koppers Company, Inc., has been named manager, Pittsburgh district. **Ralph H. Bescher** has replaced Mr. McGinnis as assistant to the general manager.

Mr. McGinnis a native of Chicago, is a graduate of Purdue University. He joined Koppers as an organization administrator in 1946. In his new capacity he will be responsible for sales, plant operations and procurement in an area covering the western portions of Pennsylvania, New York, West Virginia, Virginia, Florida, and Georgia, all of Ohio and Alabama, and Eastern Kentucky. Included in this district are eight wood-preserving plants which pressure-treat a variety of wood products.

Mr. Bescher joined the Koppers organization in 1930 as a chemical engineer. He is a native of Dayton, Ohio, and a graduate of the University of Cincinnati. In addition to his regular responsibilities as assistant to the general manager, Mr. Bescher will also have supervision and coordination of product application, act as technical adviser on sales development and supervise technical service to sales.

Walter A. Garrett, Eastern District manager of the Brainard Steel Division of Sharon Steel Corporation at New York City, has been named sales manager of steel strapping products at Warren, Ohio. **Jack V. Donner,** supervisor for the Cleveland district, has been appointed eastern regional sales manager for steel strapping sales; and **Earl J. Goetz,** district supervisor in the Chicago area, has been advanced to mid-western regional sales manager at Chicago. New manager for distributor sales of steel strapping is **Richard U. Sager,** who will head up all distributor sales activities for the steel strapping organization with offices in Kansas City. Mr. Sager was formerly district supervisor of the Kansas City district.

Walter A. Garrett

Milwaukee Road Completes Major Modernization Project

ROADBED for one of the 70 tracks in the Bensenville yard is roughed out by an INTERNATIONAL TD-14A crawler. All Milwaukee freight cars entering, leaving or passing through Chicago are now switched over the new system.

$5½ Million Bensenville, Illinois, Classification Yard Finished Ahead Of Schedule With IH Crawlers

The world's largest freight classification yard, an installation using both route switching and retarder speed control, has been placed in operation by the Milwaukee Road at Bensenville, Illinois.

The heavy work on this job . . . building new track beds, tower excavations, raising old tracks, custom dozing, even final clean up . . . was handled by two INTERNATIONAL crawlers, a TD-14A with bulldozer and a TD-9 with front-end shovel. With these dependable INTERNATIONAL crawlers on the job, the giant project was finished weeks ahead of schedule.

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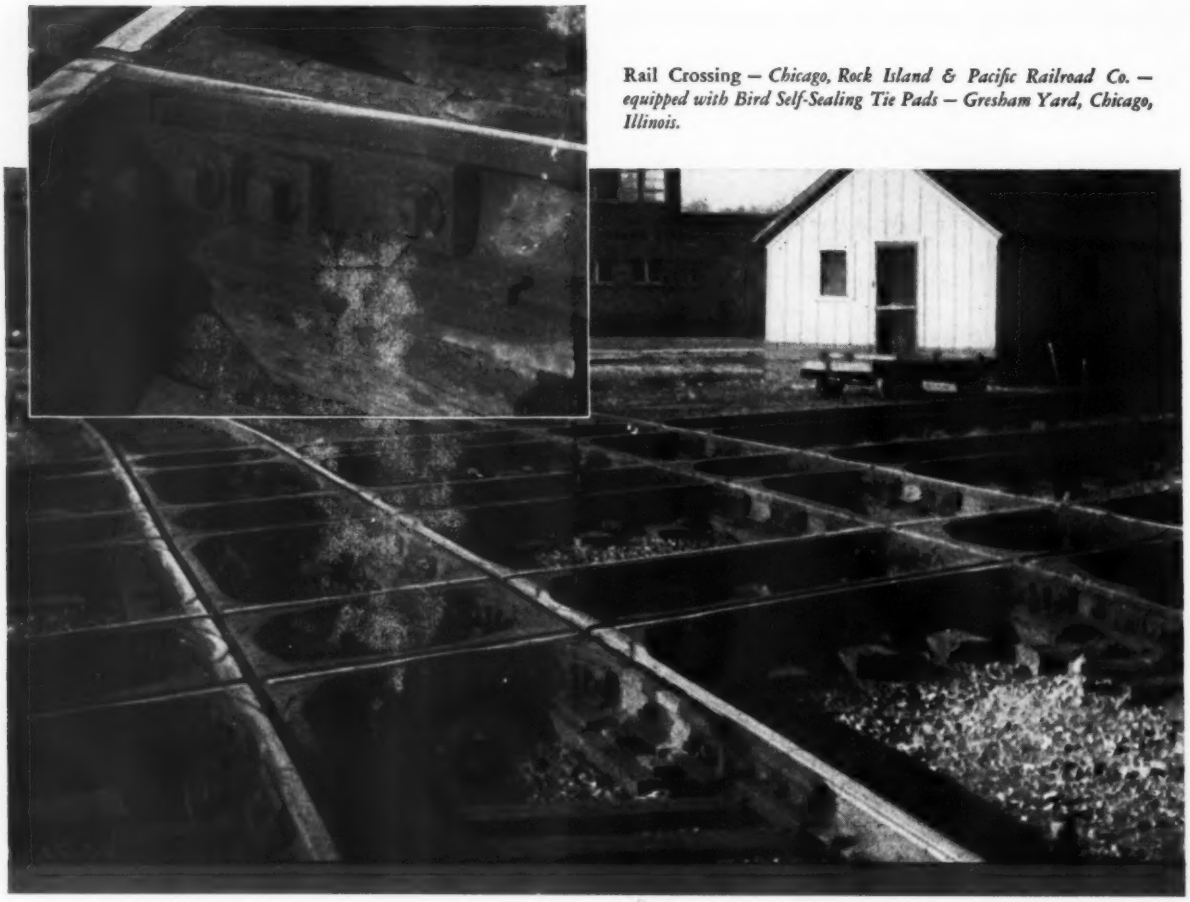

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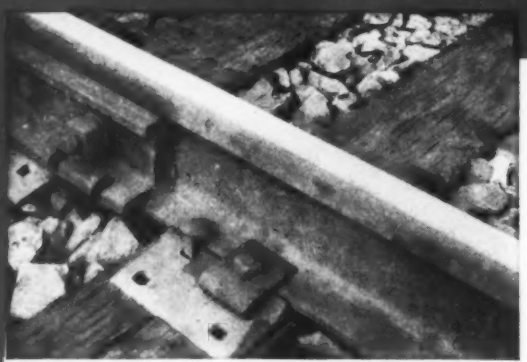
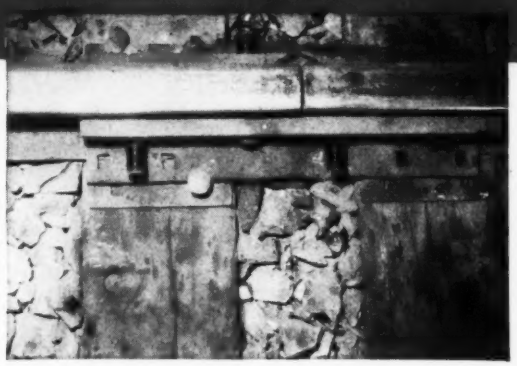


FIRST: Notice the *Texaco 1407 Plastic Plug* at end of joint. This is used to seal in the *Texaco 904 Grease* used as lubricant. Plug is in typically perfect condition after nine years' service. There has been no leakage, and plug is still keeping joint end sealed.



SECOND: Nuts backed off bolts revealed how thoroughly *Texaco 904 Grease* has worked into threads. Nuts were easily removed. Bolts show little if any wear. On this Texaco-lubricated section of track, bolt replacement has been negligible.

THIRD: Removal of joint bar shows the abundant quantity of *Texaco 904 Grease* still on the job. Remember, application was made in 1946. Also note how thoroughly the lubricant has penetrated and covered the fishing surfaces. All pictures are unretouched photographs.

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